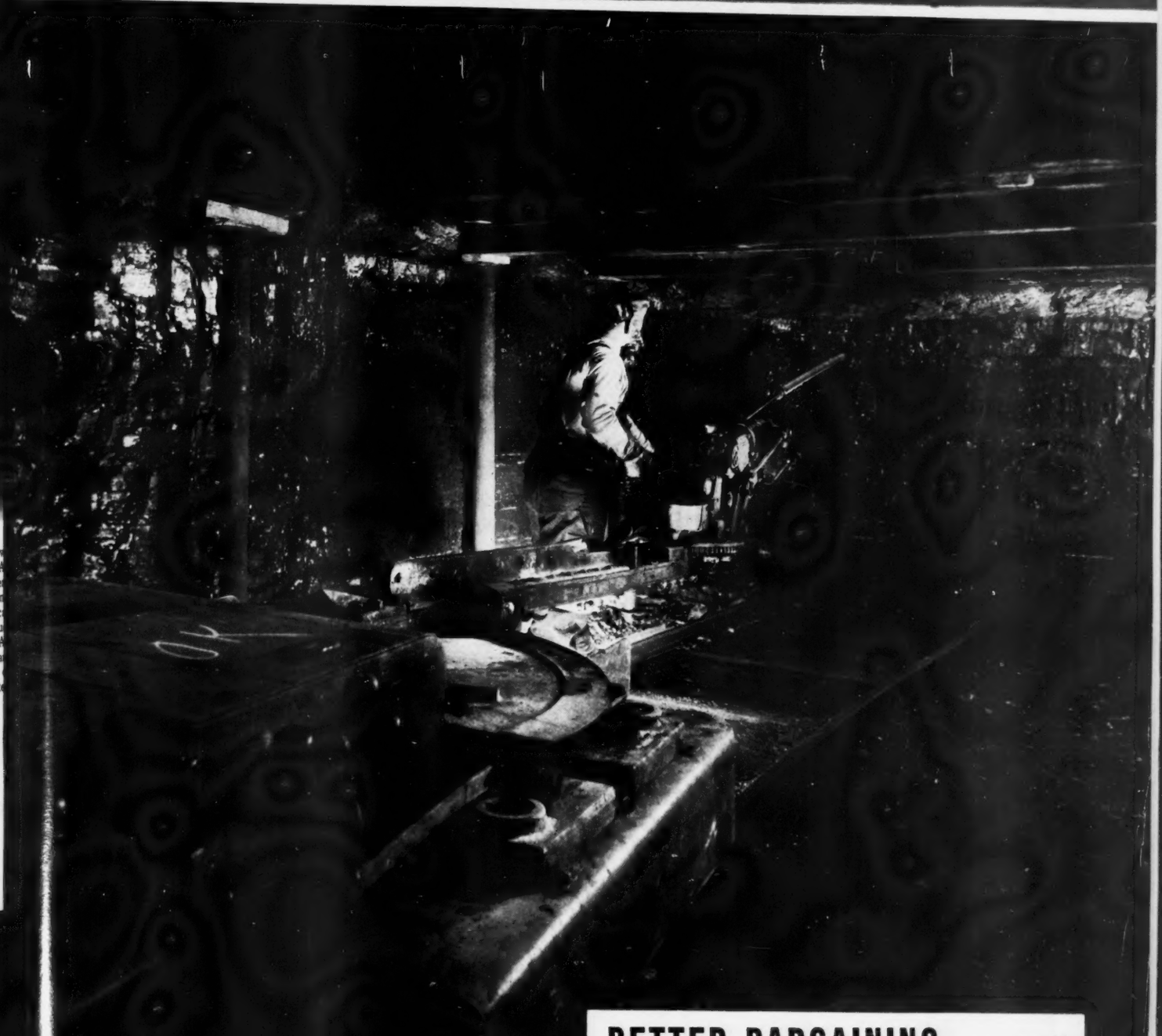
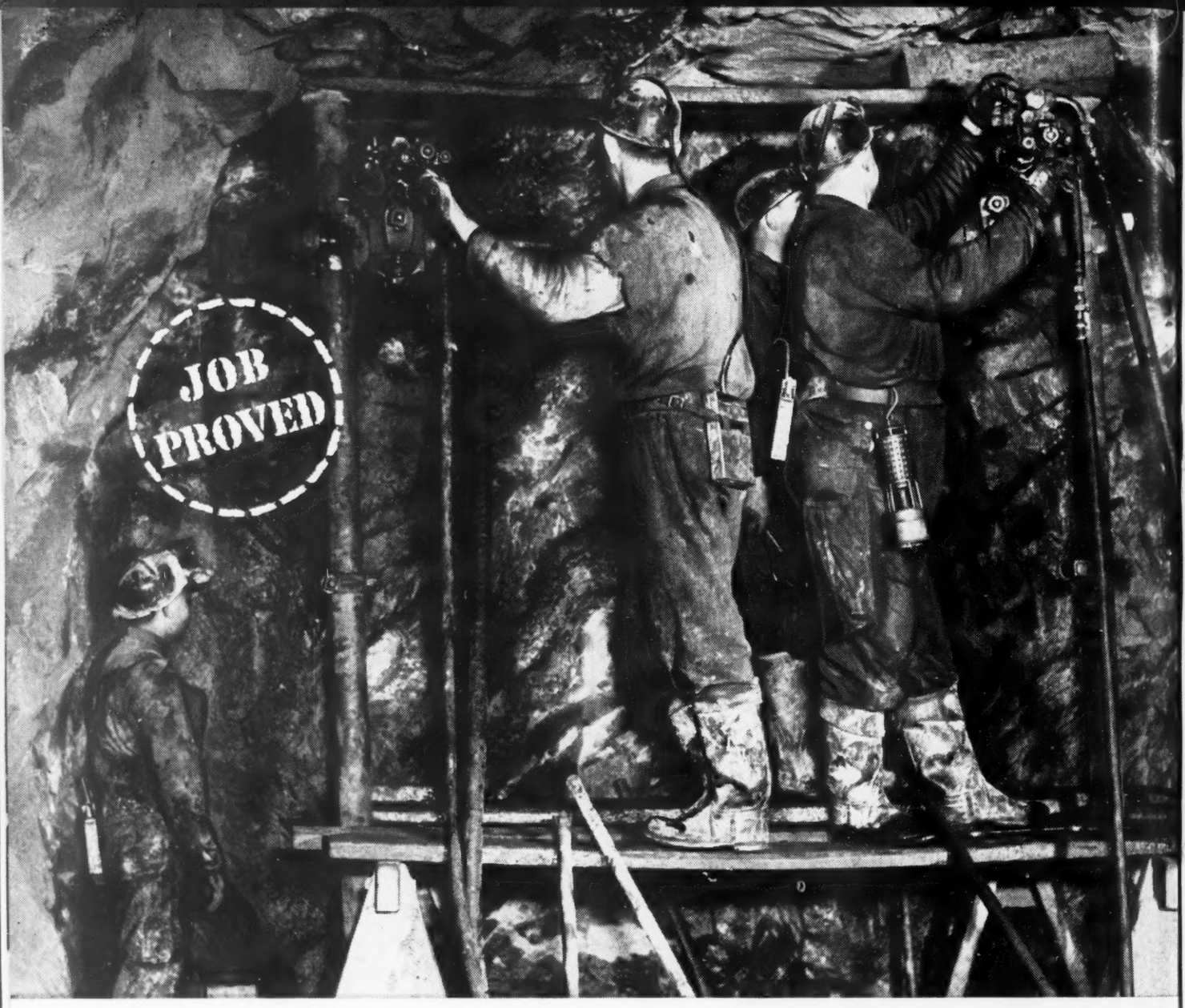
Coal Age

A McGRAW-HILL PUBLICATION

AUGUST, 1948



BETTER BARGAINING .... p. 74



PARTS REPLACEMENT REDUCED 67%

Sun Rock Drill Lubricant Also Helps Speed Drilling

Drillers in a Pennsylvania mine kept running into costly delays because the lubricant in use just wouldn't stay in the drills. Even with frequent applications, parts had to be replaced often.

Asked for his advice, a Sun engineer recommended Sun Rock Drill Lubricant . . . one of the complete line of Sun oils "Job Proved" for heavy-duty use in mine machinery.

Checking the record after 17 months, the operator found that parts replacement had been reduced 67 percent since adoption of Sun Rock Drill Lubricant for the job. Drillers report that this oil stays in the drill longer, gives constant lubrication, requires fewer applications. Results: Holes drilled faster, and at lower cost!

In mine after mine, Sun "Job Proved" lubricants help to achieve maximum protection for machinery, minimum maintenance costs. For full information, call your nearest Sun Office.

SUN OIL COMPANY • ***Philadelphia 3, Pa.***
In Canada: Sun Oil Company, Ltd.
Toronto and Montreal

SUN PETROLEUM PRODUCTS
"JOB PROVED" IN EVERY INDUSTRY

SUNOCO

TECHNOLOGY DEPT.

Research keeps
B.F.Goodrich
FIRST IN RUBBER

PUBLIC LIBRARY
AUG 13 1948
DETROIT

Tires on this 80-ton "hopper car" do a four-way job!

UNITS such as the 80-ton capacity trailer shown above are larger than most railroad hopper cars. But hauling coal in them over rough pit and haulage roads, mine to tipple, is all in a day's work at Hume Sinclair Mining Co., Pleasanton, Kansas.

Helping to make this hauling problem "routine" are the B. F. Goodrich *Universal* Silvertowns shown in the picture. It's a hauling job that could be a serious problem, for tires take a beating every inch of the way! The loads are extremely heavy, some roads are coal and rock strewn, and the pit roads are often slippery. Too, tires must *last* to help keep hauling costs down.

Read what Merle Guthrie, Mine Superintendent, has to say about B. F. Goodrich Universals . . . "this tread tends to prevent slipping when pulling out of muddy, slick pits. It also resists cutting from shale and rocks."

As to ability to stand up under loads and wear longer than ordinary tires — the answer is the B. F. Goodrich double nylon shock shield now built into all B. F. Goodrich off-road tires size 11.00/20 and larger.

The double nylon shock shield consists of four layers of *nylon* cord between the tread and the body plies. Under load and under impact, the strong, elastic nylon *shields the rayon cord body.*

Only B. F. Goodrich gives you the added protection of the double nylon shock shield . . . the additional saving through (1) longer tire life, (2) increased number of recappable tires, (3) increased bruise resistance, (4) less danger of tread separation.

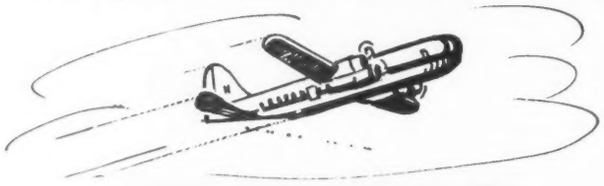
There is a specially designed B. F. Goodrich off-the-road Silvertown for every need. See your B. F. Goodrich dealer or write us direct. *The B.F. Goodrich Company, Akron, Ohio.*

Truck Tires BY
B.F. Goodrich

Make no mistake

FOR INSTANCE...

Are you mistaken about



FLYING?

When you think of airplanes, you visualize Executives, Broadway and Hollywood celebrities, Diplomats and Salesmen as their biggest class of customers. The fact is, they constitute less than. 1/8 of the patronage. It's Housewives who occupy 1/5 of all airplane seats sold!

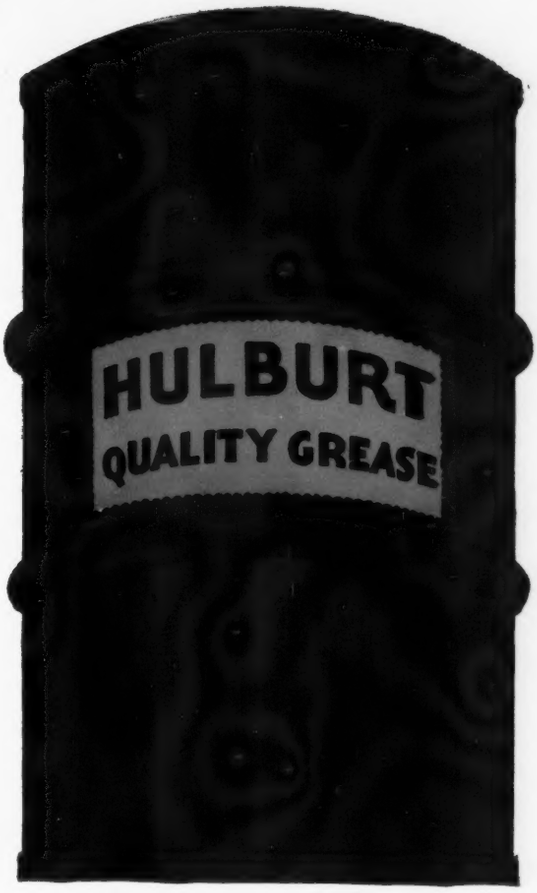
Are you "up in the air" on the matter of LUBRICATION for your Coal Mining Machinery? There are many general lubricants — but there's only one QUALITY grease made solely and specifically to meet conditions in the coal mining field — and that is HULBURT QUALITY GREASE. Pick your lubricant correctly, not from some diplomatic salesmen, but on the advice of an Engineer — a Hulburt Lubrication Engineer, who will go down in your mine and work with you on the proper use of HULBURT QUALITY GREASE.

HULBURT OIL & GREASE COMPANY—PHILADELPHIA, PENNA.

Specialists in Coal Mine Lubrication

for Coal Mine Lubrication

use



HULBURT

Quality GREASE

PROVEN BY PERFORMANCE

AT NO EXTRA COST

NEW HAZAPRENE ZBF *JACKET

gives you greater flame-resistance...greater wear-resistance

... longer, trouble-free life IN SHOVEL CABLE

ELECTRIC shovel cable has to take more kinds of punishment day in and day out than any other mining cable. With this new Hazaprene ZBF Jacketed shovel cable you'll find a solid answer to every sort of severe service problem you're up against.

Flexible, Hazaloy-coated conductors are fully protected electrically with Hazard's safer, longer-lived, *heat-resisting* insulation. Permanently colored Okobestoprene tape (a non-fibrous material, Okonite-developed from asbestos and neoprene) is precision wrapped around each insulated conductor. It seals into a flame-resistant, moisture-resistant, non-rotting protective covering . . . provides greater flexibility and protection against mechanical damage, as well as lasting conductor identification. For still more cushioning qualities and flexibility . . . and moisture tightness at cable ends — *Hazaprene* fill is used in the conductor interstices in place of the usual fibrous materials. Tough outside protection that prolongs cable life is provided by a pressure-cured, unusually dense, reinforced, double layer Hazaprene ZBF Jacket. This Hazaprene ZBF Jacket provides greater resistance to flame and mechanical damage than was ever obtainable before. And, like other neoprene compounded sheaths, it remains unaffected by moisture, oil, sunlight, acids, etc.

* ZBF ZINC BORATE FORMULA

Flame tests have shown that Zinc Borate imparts greatly increased fire-resistant properties to neoprene compounds with burning rates reduced by as much as 20% and weight losses by as much as 40%. Afterglow is materially reduced also. Millions of feet of cable protected by this type of jacket were used during the war by the Navy for special operating conditions to gain extra fire protection. Hazaprene ZBF Jackets mean not only greater safety because of unusual flame-resistance and lack of afterglow — but also longer life through increased resistance to abrasion, wear and tear.

For longer-lived, safer shovel cable, it will pay you to get all the information about new Hazaprene ZBF Jacketed Shovel Cable from your Hazard representative today, or write us. Hazard Insulated Wire Works, Division of The Okonite Company, Wilkes-Barre, Pa.

HAZARD

6874

insulated wires and cables for every mining use

Coal Age

Alfred M. Staehle, Publisher
IVAN A. GIVEN, Editor
J. H. Edwards — R. R. Richart
W. H. McNeal — W. A. Stanbury Jr.
F. A. Zimmerli
George E. Doying Jr., Washington
H. R. Mathias, General Manager
World News Offices: London, Paris, Berlin, Moscow, Tokyo, Bombay, Melbourne, Rio de Janeiro, Buenos Aires

A McGRAW-HILL PUBLICATION

COAL AGE (with which is consolidated "The Colliery Engineer" and "Mines and Minerals") is published monthly on the 1st. Allow at least ten days for change of address.

Subscription rates: United States and possessions, $5 for one year, $8 for two years, $10 for three years. Canada, $6 for one year, $10 for two years, $12 for three years. Pan-American countries, $6 for one year, $10 for two years, $12 for three years. All other countries, $15 for one year, $30 for three years. Single copies: U. S. and possessions and Canada, 50c; Pan American countries, 75c; all other countries, $1.50. Application for second-class entry at the Post Office in Chicago, Ill., is pending under the Act of March 3, 1879. Printed in the U. S. A. Cable Address: "McGraw-Hill N. Y." Member A.B.P. Member A.B.C. Please indicate position and company connection on all subscription orders.

Return Postage Guaranteed

Contents Copyright 1948 by McGraw-Hill Publishing Co., Inc.: all rights reserved

JAMES H. McGRAW (1860-1948)
Founder

JAMES H. McGRAW JR.
President

CURTIS W. McGRAW
Vice-President and Treasurer

EUGENE DUFFIELD
Executive Assistant for Publications

NELSON BOND
Director of Advertising

JOSEPH A. GERARDI
Secretary

J. E. BLACKBURN JR.
Director of Circulation

Publication office: 210 S. Desplaines St., Chicago 6, Ill. **Editorial and executive offices, 330 W. 42nd St., New York 18, N. Y.** Branch offices: 520 North Michigan Ave., Chicago 11; 68 Post St., San Francisco 4; Aldwych House, Aldwych, London, W.C. 2; Washington, 4; Philadelphia, 3; Cleveland, 15; Detroit, 26; St. Louis, 1; Boston, 16; Atlanta, 3; Los Angeles, 14; 738-9 Oliver Bldg., Pittsburgh, 22.

All communications about subscriptions should be addressed to the Director of Circulation, Coal Age, 330 W. 42nd St., New York 18, N. Y.

District Managers: T. E. Alcorn and F. W. Roets, New York; W. A. Potter, Philadelphia; W. M. Spears, Cleveland; H. C. Chellson, Pittsburgh; C. J. Coash, G. A. Mack, Chicago.

CONTENTS

AUGUST, 1948

Volume 53 — Number 8

Better Bargaining for Coal ... 74

New Mine—High Efficiency ... 80

Concentrated Stripping ... 84
By J. H. EDWARDS

Haulage Helps at New Jellico ... 92

Preparation at St. Nicholas ... 94
By OTTO P. SWARTZ and R. R. RICHART

Permanent Magnets for Coal ... 102
By F. E. PARKE

More From Wheels and Axles ... 105
By FRED W. RICHART

Fog Gun Cuts Dust and Gas After Blasting ... 114

Cars Changed While Belt Runs ... 116

Tractor Loader a Versatile Unit ... 118

Shock to Dipper Hinge Pins Relieved ... 120

Self-Feeding Shaker Conveyor Handles Rock Disposal ... 120

Editorials ... 73

Foremen's Forum ... 110
Coal Men on the Job ... 108
News Round-Up ... 123
Equipment News ... 172

CHANGE OF ADDRESS

Director of Circulation, COAL AGE
330 West 42nd St., New York 18, N. Y.

Please change the address of my COAL AGE subscription as follows:

Name .....

Old Address .....

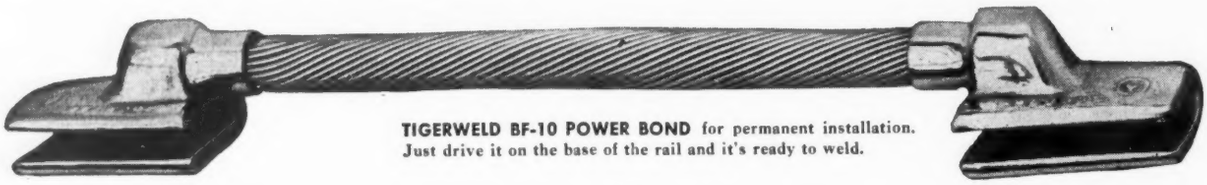
New Address .....

New Company Connection .....

New Title or Position .....

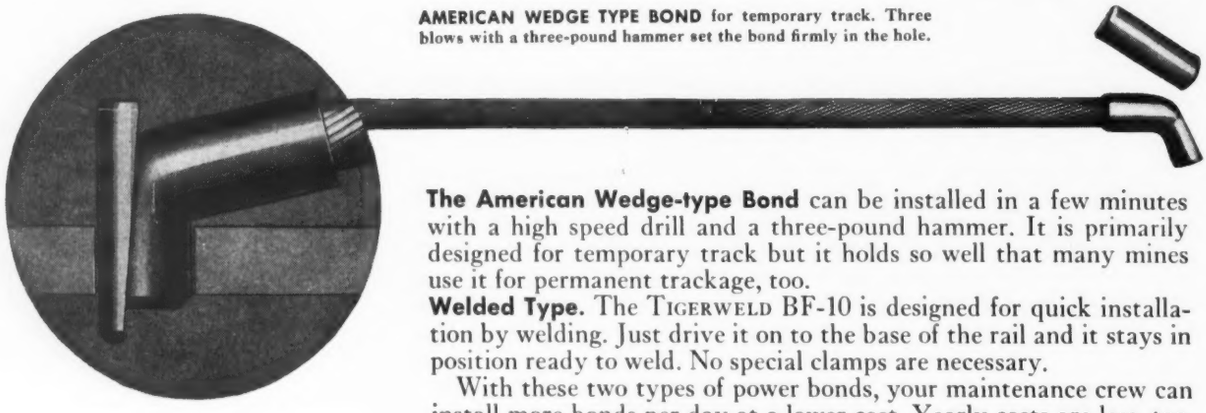
Maintenance Men "go for" these bonds

THEY GO ON FASTER...STAY PUT LONGER...



TIGERWELD BF-10 POWER BOND for permanent installation. Just drive it on the base of the rail and it's ready to weld.

AMERICAN WEDGE TYPE BOND for temporary track. Three blows with a three-pound hammer set the bond firmly in the hole.



The American Wedge-type Bond can be installed in a few minutes with a high speed drill and a three-pound hammer. It is primarily designed for temporary track but it holds so well that many mines use it for permanent trackage, too.

Welded Type. The TIGERWELD BF-10 is designed for quick installation by welding. Just drive it on to the base of the rail and it stays in position ready to weld. No special clamps are necessary.

With these two types of power bonds, your maintenance crew can install more bonds per day at a lower cost. Yearly costs are less, too, because the bonds have high resistance to vibration and great mechanical strength. They won't shake loose.

For complete information on all types of U·S·S TIGERWELD Rail Bonds, write to our nearest district office. Ask for the rail bond book.

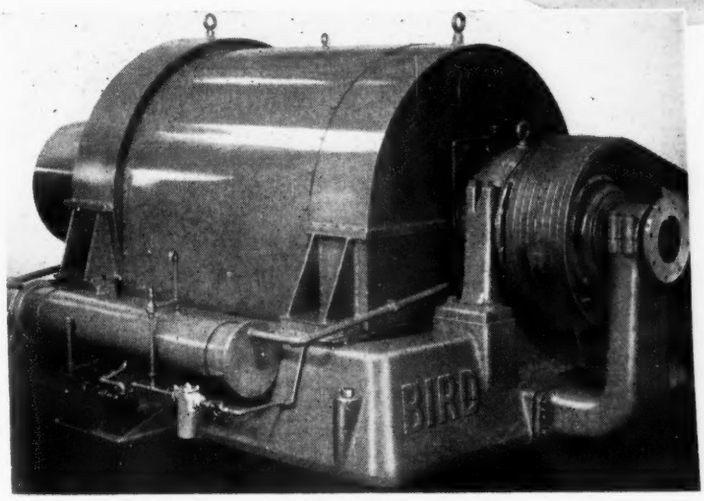
AMERICAN STEEL & WIRE COMPANY, GENERAL OFFICES: CLEVELAND, OHIO
COLUMBIA STEEL COMPANY, SAN FRANCISCO, PACIFIC COAST DISTRIBUTORS
TENNESSEE COAL, IRON & RAILROAD COMPANY, BIRMINGHAM, SOUTHERN DISTRIBUTORS
UNITED STATES STEEL EXPORT COMPANY, NEW YORK

USS

U·S·S American Rail Bonds

UNITED STATES STEEL

This Is The Way To Get The Water Out Of Your WASHED FINE COAL



Simply feed the BIRD the fine coal from launders or tables, or the settled fines and a generous quantity of overflow from the sludge tanks, if you clean all sizes at once.

The BIRD delivers the dried fines just right for blending or for thermal drying. Not more than 6 to 10% moisture remains in the coal.

The BIRD gets the water so clean it can be used over and over—in a closed circuited plant only 5% of the solids remain in the water.

The BIRD handles big tonnages continuously without shutdowns for parts replacements. Let us tell you what its operating advantages and savings mean to your cleaning system.

BIRD MACHINE COMPANY, South Walpole, Mass.

The BIRD Centrifugal FILTER

HAVE YOU BEEN Tough ABOUT PREPARATION COSTS?

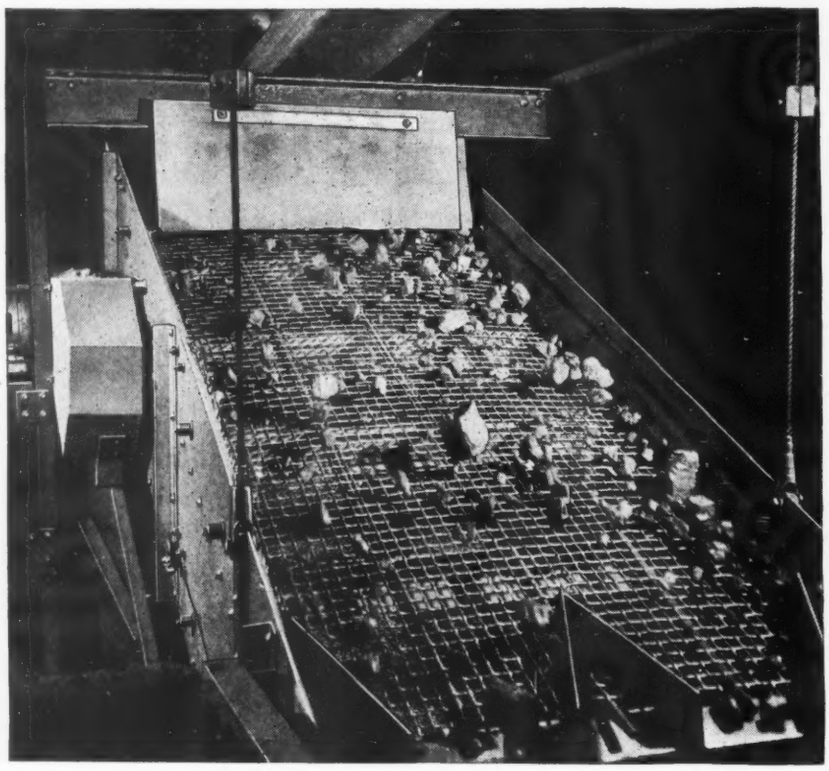
WHAT A DIFFERENCE *modern* equipment makes in keeping tonnage up and costs down! Many small savings add up to profit dollars fast in coal. That's why forward-looking coal men are modernizing their plants now — bringing *all* their operations up to tip-top efficiency.

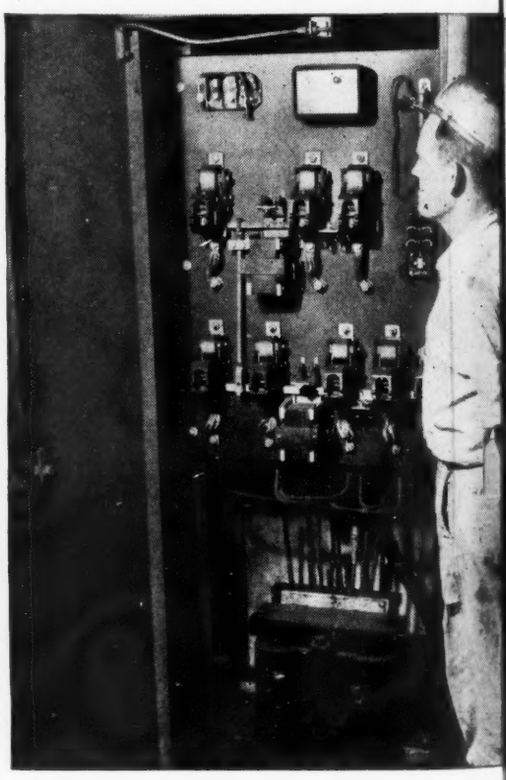
Many specify Allis-Chalmers coal preparation, power and auxiliary equipment. And with confidence . . . for here's equipment of full-value design, built for ruggedness and ease of maintenance.

Equipment recommendations are made by coal equipment specialists when you call on Allis-Chalmers. They're guided by A-C's long experience as a coal industry supplier.

What's more, you can get Allis-Chalmers equipment in a maximum range of types and sizes. That means better *suitability* to your specific requirements. Maximum economy!

Call the A-C representative in your locality. He'll help you examine your operations for hidden losses caused by inefficient equipment. ALLIS CHALMERS, MILWAUKEE, WIS.

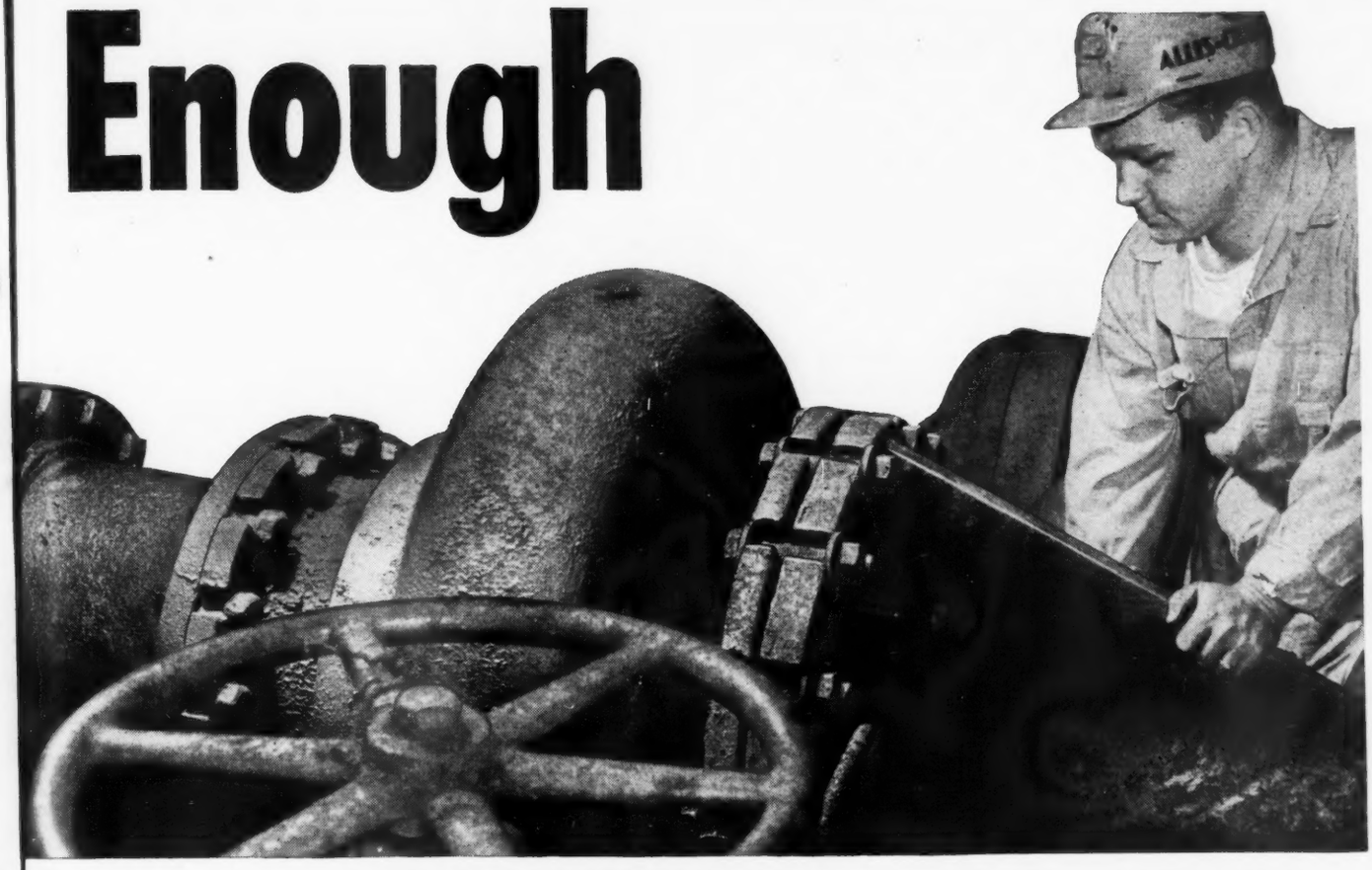


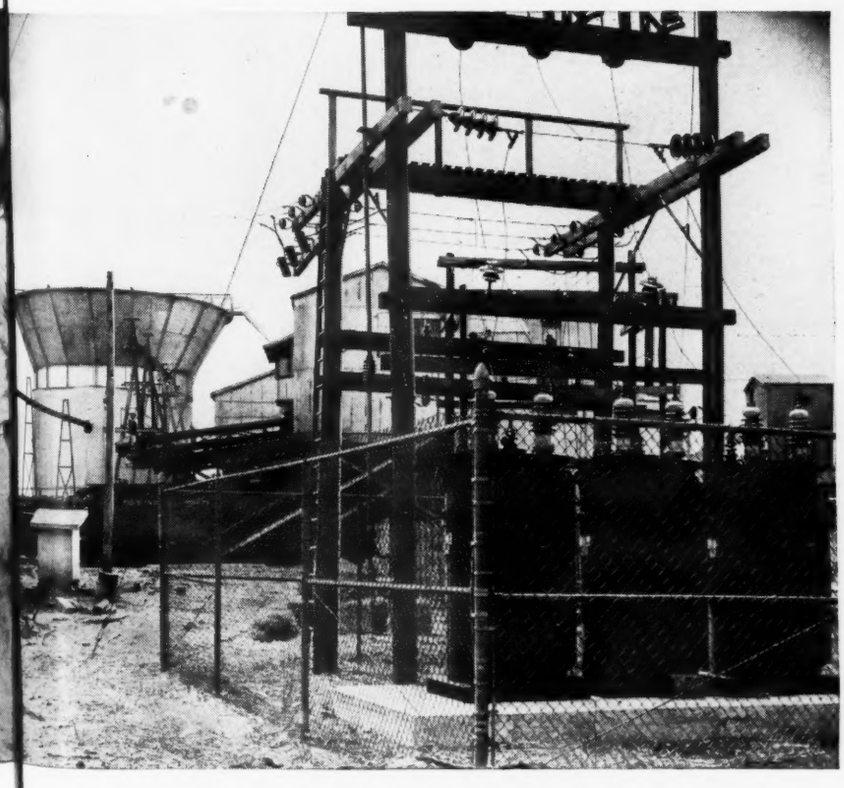


RIPL-FLO SCREENS Double deck *Ripl-Flo* vibrating screen, separates 1¼ and ⅜ in. coal. These screens are widely used for screening R.O.M., egg, range, nut, and stoker coal. Screening capacity can be increased with *Ripl-Flo* screens because circle throw action results in rapid stratification and a more even bed depth of coal on screen. Screening costs can be reduced because elimination of outer bearings and support frame results in lower weight and power requirement. All-welded "stress-relieved" construction assures lasting durability . . . Allis-Chalmers' method of supporting screen cloth results in long cloth life. Sizes 3 by 6 to 6 by 16 ft. **Bulletin 07B6151B.**

MOTOR CONTROL This fully enclosed automatic reduced voltage *motor starter* provides overload and undervoltage protection for a tailings pump in a coal preparation plant. A combination of wiping and rolling action keeps contacts in prime condition. Allis-Chalmers furnishes a complete line of motor control for every condition of motor operation. Type H starters are described in **Bulletin 14B6410.**

Enough





CENTRIFUGAL PUMPS

Here's pump for dewatering operations—it will handle tailings having up to 40% solids in suspension. The *CW Solids pump* is built by Allis-Chalmers with only five separated internal parts, made of abrasion-resistant alloy. Less costly parts replacement! Working parts can be replaced without disturbing piping. Less maintenance! Above is a 6,000 gpm unit. **Bulletin 08B6338B.**

POWER DISTRIBUTION

Allis-Chalmers builds *distribution and power transformers* for any industrial requirement. These include units for indoor or outdoor use . . . oil or non-inflammable liquid *(Chlorextol)* filled. Bank of three Allis-Chalmers transformers, above, distribute power for coal mine equipment and auxiliary needs. Design and construction features are explained in **Bulletin 01R6186.**

A 2452

Ripl-Flo and Chlorextol are Allis-Chalmers trademarks

ALLIS-CHALMERS

--- BUILDS FOR COAL PROGRESS!

Cut your operating costs these 12 ways

—with COAL-FLO conveyor belts

STOP that steady rise in your cost-per-ton. Here are bed-rock facts that speak for themselves. Facts proved by more than 20 years' experience in America's most progressive coal mines. Facts vouched for by cost-wise operators who have cut their operating expense in these 12 major cost items by installing Goodyear Coal-Flo conveyor belting to carry coal outby from face to tipple. Check them off, item by item, and figure how much you could save.

COAL-FLO ECONOMIES

1. Coal-Flo conveyor haulage eliminates tracks and switches, bonding, heavy grading; operates efficiently over pitches and rolls without jamming or mashing coal.

2. Cuts timbering cost 50%. The belt runs close to the rib, enabling you to use a single prop under the center of the roof load, insuring far greater safety, with much less lumber.

3. Up to 20% more lumps in low seams, due to a greater clearance between belt and roof, plus gentler handling.

4. No danger of runaways with peril to "hot-footers." Haulage injuries are virtually unknown.

Let us show you proof — in color

With the willing help of several mines conveyorized with Goodyear Coal-Flo belting, we have just completed an historic color-sound picture that covers the evolution of the coal industry from creel to conveyor. In this motion picture you will see complete, visual proof of every saving mentioned in this advertisement. To see it at your own office, just call your nearest Goodyear Industrial Rubber Products Distributor — his name is in your classified telephone directory.

Timbering costs average about 50% less with Coal-Flo conveyors. The single prop under the roof-center gives greater support and security than two side timbers.

5. Far greater ton-per-hour capacity because haulage is continuous—there's no time lost for car spotting. Your cutters and loaders have no time out.

6. Greater fire and explosion safety through elimination of bare wires and charged coils, sparks and broken cables.

7. Far less brushing—you leave your gob inside even in low-seam coal because Coal-Flo belts require minimum head-room.

8. 50% to 75% lower power, maintenance and operating cost—you have no haulage crews with Coal-Flo belts.

9. Silent operation—you can hear a "working" roof.

10. Fewer roof-falls because of safer timbering and no operating vibration.

11. More uniform power demand—no surges, no peaks and valleys as occur with intermittent haulage. Better voltage regulation.

12. Continuous, uniform, automatic delivery at the tipple—no dumping crew required.

THIS IS VERY IMPORTANT:

To secure ALL these advantages over a long-time period it is essential that you specify Goodyear Coal-Flo belting. It is the only belting that is safeguarded against ALL forms of underground mildew—the greatest enemy of mine belting. That is proved by its records, running as high as 40 million tons in coal service.

Let the G.T.M.—Goodyear Technical Man—give you the factual dollars-and-cents story of many mines that have modernized with Coal-Flo conveyors. Write: Goodyear, Akron 16, Ohio or Los Angeles 54, California.

GOODYEAR

THE GREATEST NAME IN RUBBER

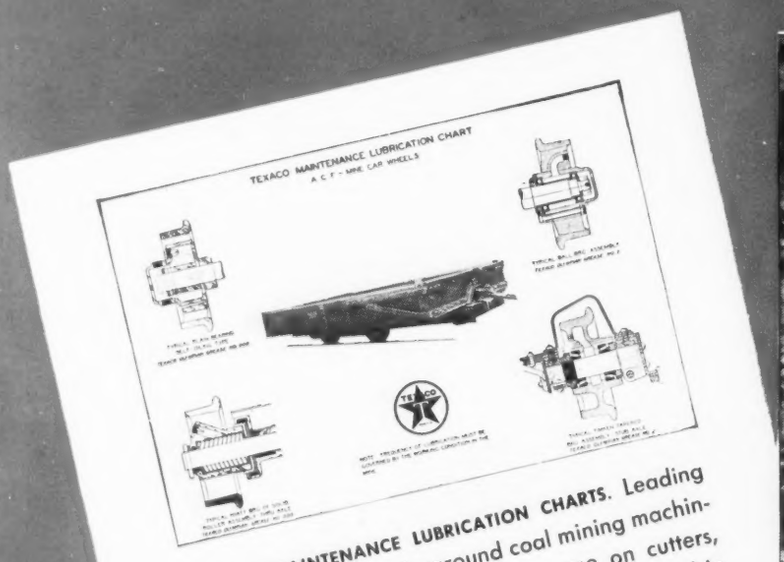
Coal-Flo—T.M. The Goodyear Tire & Rubber Company

Goodyear Coal-Flo belts carry coal outby continuously. There's no stand-by time for spotting—no lost time for loaders.

Slope belt carries coal in continuous flow from underground belts or surge bin to tipple.

MORE TONNAGE COMES OUT

Texaco Olympian Grease assures easier starts, allows longer trains.



TEXACO MAINTENANCE LUBRICATION CHARTS. Leading manufacturers of underground coal mining machinery approve Texaco products for use on cutters, loaders, locomotives, etc., and have cooperated in preparing these charts. Charts show clearly where and when to use the proper Texaco lubricants. Order the charts you need by make and model of each machine.

Tune in . . .
TEXACO STAR THEATER
every Wednesday night
featuring Gordon MacRae
and
Evelyn Knight . . .
ABC Network.

TEXACO
REG. T.M.

TEXACO LUBRICANTS

HERE's a grease that reduces frictional drag . . . that really *stands up* in service. That's why, when you put *Texaco Olympian Grease* in plain, cavity hub or anti-friction wheel bearings, you can start your cars easier and haul longer trains.

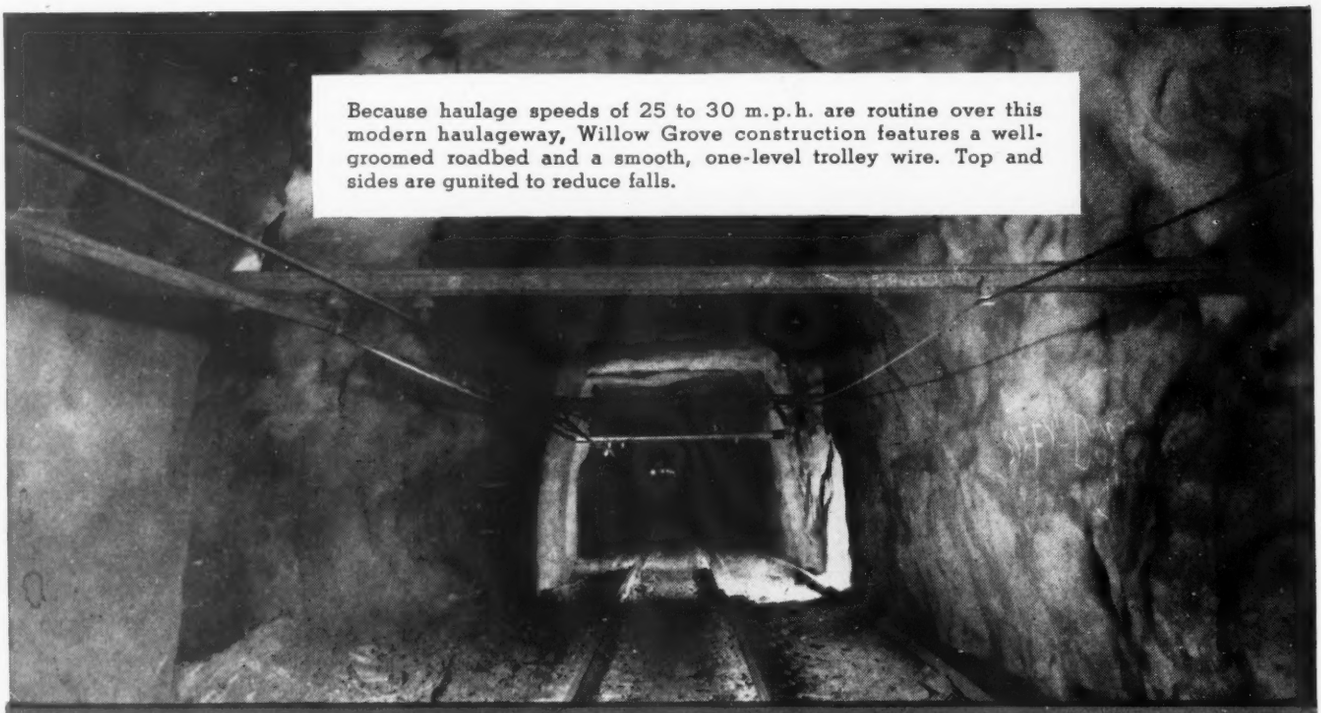
With *Texaco Olympian Grease* you'll have no trouble with separation in storage or leakage in service . . . no trouble in application. You'll find it retains its effective lubricating qualities in spite of moisture and low temperatures — the latter an important consideration in winter operation.

Texaco Olympian Grease is made in three consistencies to meet all requirements. Use it also for cutters, loaders and similar equipment. It will keep your machines running smoothly and save on maintenance costs.

Let a Texaco Lubrication Engineer help with *all* your lubrication. Just call the nearest of the more than 2500 Texaco Wholesale Distributing plants in the 48 States, or write The Texas Company, *National Sales Division, Dept. C,* 135 East 42nd Street, New York 17, N. Y.

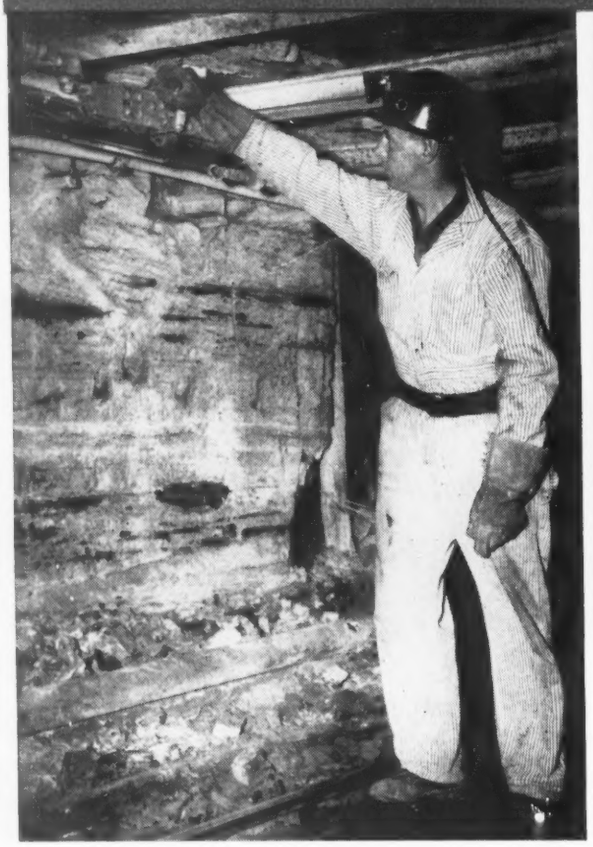
PROOF that Texaco assures effective lubrication lies in the fact that — *more locomotives and railroad cars in the U.S. are lubricated with Texaco than with any other brand.*

For the Coal Mining Industry



Because haulage speeds of 25 to 30 m.p.h. are routine over this modern haulageway, Willow Grove construction features a well-groomed roadbed and a smooth, one-level trolley wire. Top and sides are gunited to reduce falls.

OVERHEAD MAINTENANCE AT WILLOW GROVE COSTS LESS THAN .01 cents per ton-mile

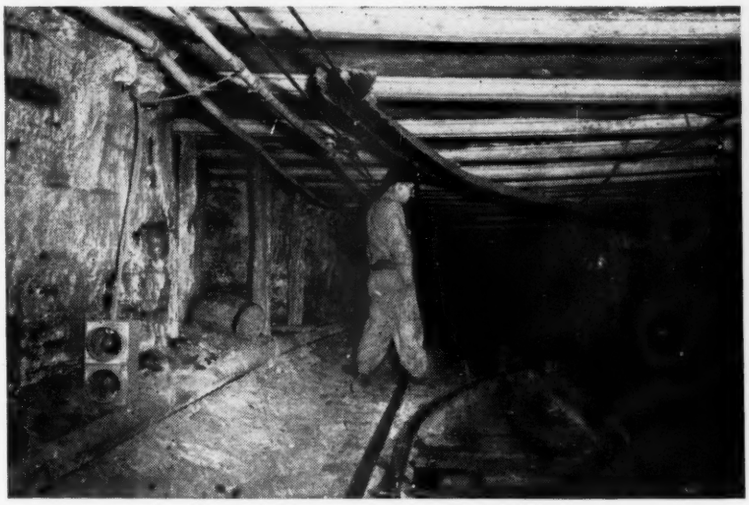


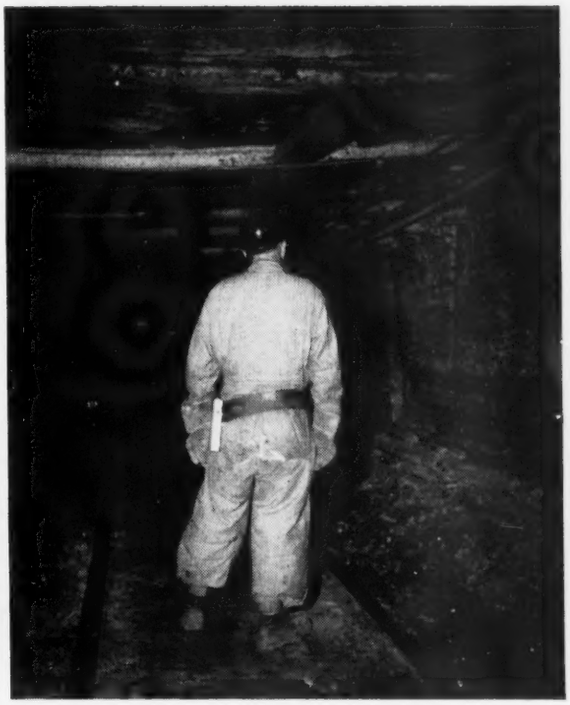
A radio telephone system provides fast, easy communication between dispatcher and the various gathering motors.

Willow Grove places O-B Section Insulators in the wire at intervals of 1500 feet. This practice affords safe, fool-proof trolley sectionalization.

Flexible guard board is used at turnouts and other locations where men must cross under the wire.

One man walks Willow Grove haulageways every day, checking the system and noting points requiring maintenance. All necessary repairs are made promptly.





Good Materials, Properly Installed and Maintained, Promote Low-Cost Haulage at Modern Hanna Mine

Trolley haulage is doing a job at Willow Grove, modern Ohio mine of the Hanna Coal Company. Powerful 21-ton locomotives speed over its eight-mile main haul, making an average of 39 round trips every 24 hours. More than 800 loaded cars are pulled over its length daily. Yet in spite of this hard service, overhead maintenance costs average less than .011 cents per ton-mile. Other costs are proportionately low.

Hanna does not skip on maintenance, either. One man walks the track daily, looking for worn spots. All necessary repairs are made immediately. One important reason for the low costs can be traced to Hanna's policy of using only top-quality materials in the first place. These are installed carefully and properly to insure maximum performance. Regular maintenance tells the rest of the story.

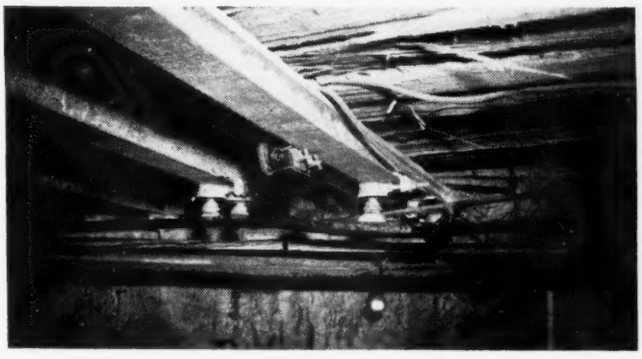
The same policy can insure dependable, low-cost transportation at your mine. It is as simple as one, two, three — good materials *plus* good installation *plus* good maintenance *equals* good trolley haulage. Why not put this program into effect at your mine?

Ohio Brass

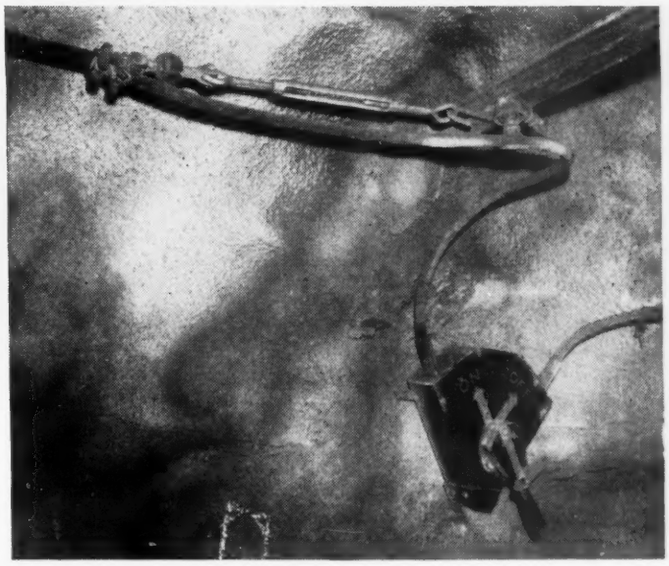
MANSFIELD, OHIO

Canadian Ohio Brass Co., Ltd., Niagara Falls, Ont.

2819-M



Trolley is suspended from steel timbers by O-B I-Beam Hangers and Bulldog Clamps. Because the timbers are kept at a uniform height, the trolley wire stays at one level.



An O-B Dead-End Assembly takes up the cable strain at lead-ins to O-B Safety Feeder Switches.

Here's Track for *High-Speed* Trips

Like the looks of that track in the picture? Swell example of what we can do in a main haulage system! Traffic moves fast over this one. Fast and safely—note that perfect alignment!

Whenever you plan to revamp main haulageways — or to make additions — we'd like to talk track with you. Bethlehem builds every item of mine track equipment, including rails in popular weights, switch stands, switches, frogs, complete turnouts, crossings, guard rails, braces, and steel ties. We've been in this business for a good many years; every one of these items has proved itself through long service.

For rooms and secondary haulageways and special main-haulage layouts, Bethlehem offers prefabricated track — a great time- and labor-saver. Easily handled, it can be laid and removed double-quick, with little fuss or bother. Each layout is designed individually; built to a plan approved by the customer. Ask us to tell you about it—it's really caught on!

★ BETHLEHEM STEEL ★

BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.

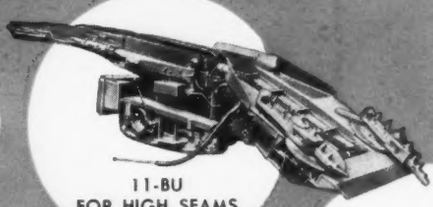
On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation

Export Distributor: Bethlehem Steel Export Corporation

JOY LOADERS

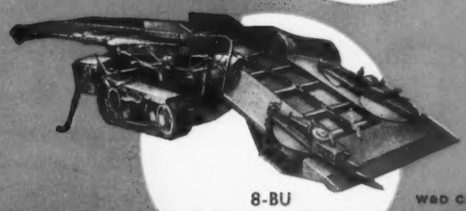
HANDLE TONNAGE FASTER— AT LESS COST PER TON

High seam or low seam—Joy makes a loader that will do the job better, faster, more economically. Moreover, maximum loading rates are easy to maintain with these extremely flexible Joy Loaders.



11-BU
FOR HIGH SEAMS

14-BU
FOR LOW SEAMS



8-BU
FOR CONVEYOR
MINING

Consult a Joy Engineer

W&D CL 13

JOY MANUFACTURING CO.

GENERAL OFFICES: HENRY W. OLIVER BUILDING • PITTSBURGH 22, PA.

Less maintenance, greater availability* for every type of loader

***Availability** . . . loader spends more time at the face, less time in the shop.

Three good examples of how Superla Mine Lubricants help keep loaders on the job without shutdown for maintenance are described at the right. You'll find your loader in the wide range of types to which these versatile lubricants are applied.

Why not let the experiences of midwest mines cited here be the basis for a test of Superla Mine Lubricants in your equipment. A Standard Oil Lubrication Engineer will gladly help you. Write Standard Oil Company (Indiana), 910 South Michigan Avenue, Chicago 80, Illinois.

Six grades for lubricating any type of cutter or loader

No. 00. An oxidation-inhibited oil containing a detergent additive. It provides exceptionally clean operation and low oil consumption for oil-lubricated gear cases.

No. 0. A high-quality additive-type oil similar to No. 00 but of a slightly heavier grade. It is designed for Goodman loaders and cutters.

No. 2. A soft, semi-fluid grease for lubricating gathering-head gear cases where greater fluidity than that usually provided by most loader greases is desired.

No. 4. A semi-smooth grease particularly resistant to thinning out under heat and mechanical working. At the same time it can easily be poured from the barrel bung at ordinary mine temperatures. It is especially designed for Joy loaders.

No. 6. A grease of heavy consistency and good high-temperature characteristics. Its fibrous structure makes it particularly useful on mine car wheels and for general underground lubrication.

No. 8. A smooth grease having superior high-temperature characteristics. It is suitable for armature bearings and pressure-gun work where a grease of heavy consistency is desired.

Superla Mine Lubricants

STANDARD **STANDARD OIL COMPANY (INDIANA)**

Cleaner operation in Goodman loaders

Superla Mine Lubricant No. 0 keeps oil-lubricated transmissions free of hard carbon. An oxidation inhibitor reduces oil deterioration at high temperatures. A detergent additive keeps gear-case contaminants from settling out on clutch plates and gears. Cleaner operation reduces wear on machine parts, cutting replacement costs and downtime.

Example: A midwest mine's repair shop records showed a 50% reduction in loader-maintenance costs for repair parts and labor, in 1½ years of operation. Superla Mine Lubricant No. 0 was used. There was no downtime due to oil failures.

Longer clutch plate life in Joy loaders

Superla Mine Lubricant No. 4 is a loader grease that flows freely at low temperatures, resists thinning out under heat and mechanical working. When the machine starts, this lubricant reduces wear by readily covering bearings, gears, and clutches. During long periods of continuous operation, it maintains its strong lubricating body to protect machine parts against scoring and wear.

Example: During a 6-month test period with Superla Mine Lubricant No. 4, no clutch plates were replaced in a midwest mine's Joy loaders. No time was lost in warming up when starting loaders. No shutdowns occurred because of faulty lubrication.

More efficient grease servicing of mine equipment

Superla Mine Lubricant No. 2 is a soft, semi-fluid grease of greater fluidity than most loader greases. For this reason, it makes an ideal lubricant for gathering head gear cases, "buster" clutches, and general use in cutters.

Example: Superla Mine Lubricant No. 2 handled easily in the suction guns of a midwest mine. Grease servicing of 8 cutters and 10 loaders took a minimum of time and labor. Machine gear cases stayed exceptionally clean.

STANDARD OIL COMPANY (INDIANA)

STANDARD

The Right Answer Will Be Found in the COMPLETE INTERNATIONAL LINE

YES, the International Line provides a truck of the right type and size for every job.

- A truck that is *Performance-Coordinated* — engine, transmission, rear axle and all other components—to fit your particular hauling problem.
- A truck that is solid International quality all the way through — rugged, dependable, long-lived and economical to operate.
- A truck that is the product of 41 years of International truck-building experience.
- And your International Truck is *Load-Coordinated* as well as Performance-Coordinated.

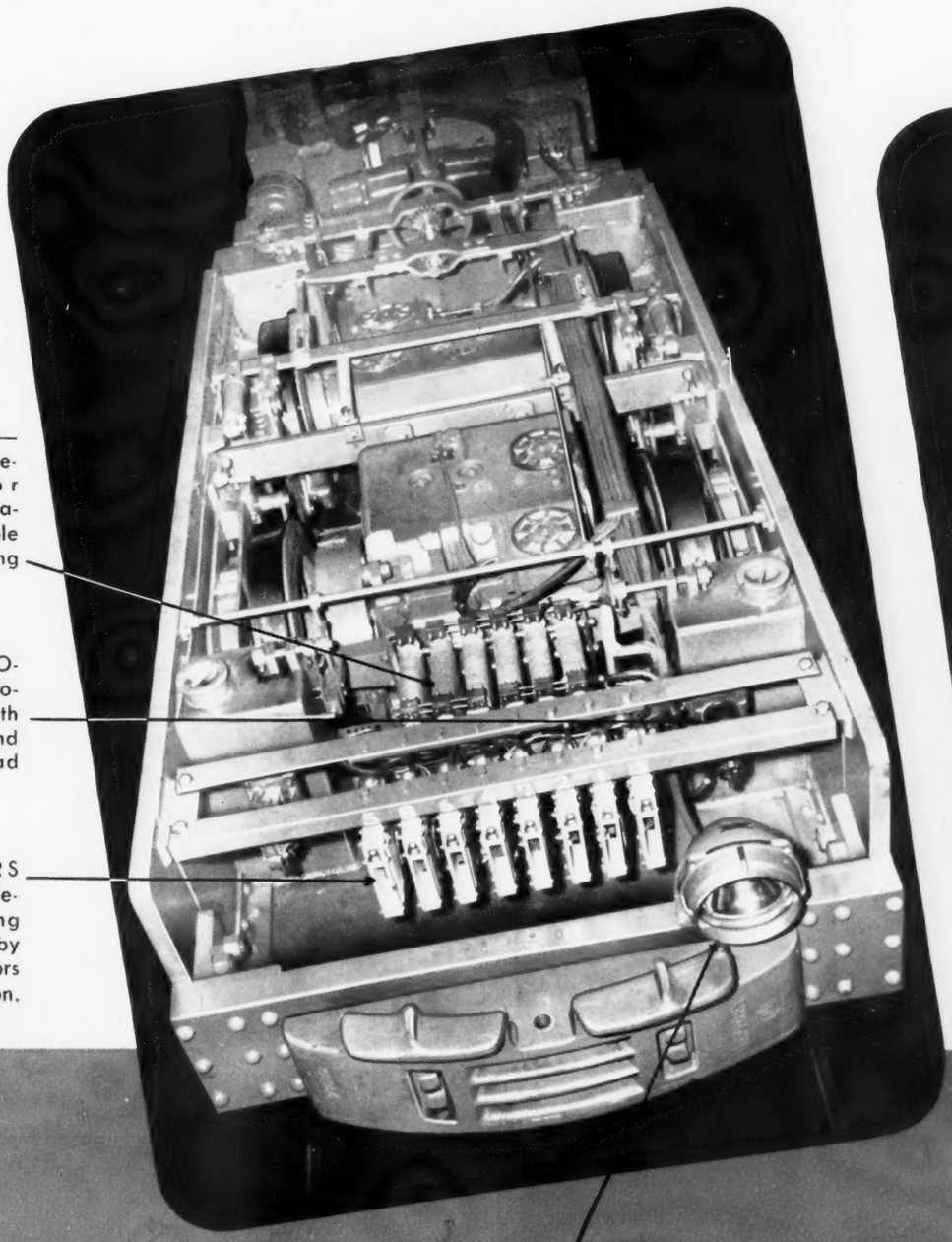
It is Load-Coordinated by the *exclusive* International Truck Point Rating System to tell you *exactly* the payload most profitable on *your job.*

Tune in James Melton on "Harvest of Stars!"
CBS Wednesday Evening

Motor Truck Division
INTERNATIONAL HARVESTER COMPANY
180 North Michigan Avenue Chicago 1, Illinois

INTERNATIONAL

INTERNATIONAL Trucks

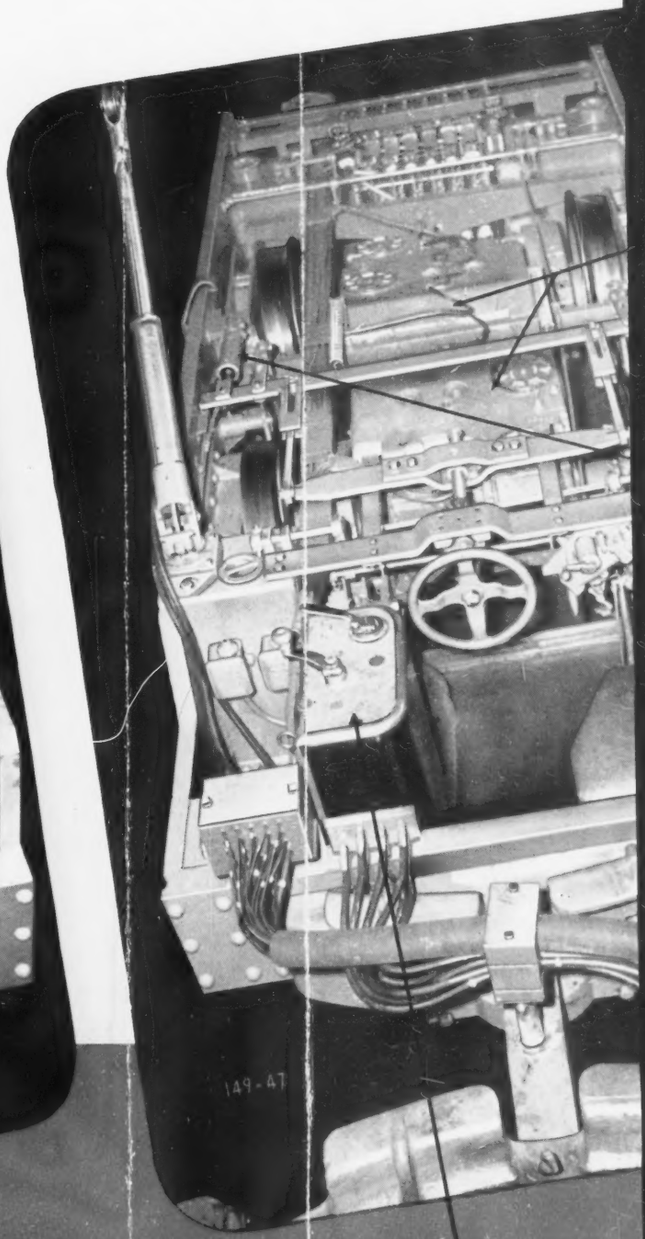


RESISTANCE— Heavy duty, designed for smooth acceleration and ample current carrying capacity.

OVERLOAD PROTECTION — Protect motors with magnetic or hand reset Overload Relays.

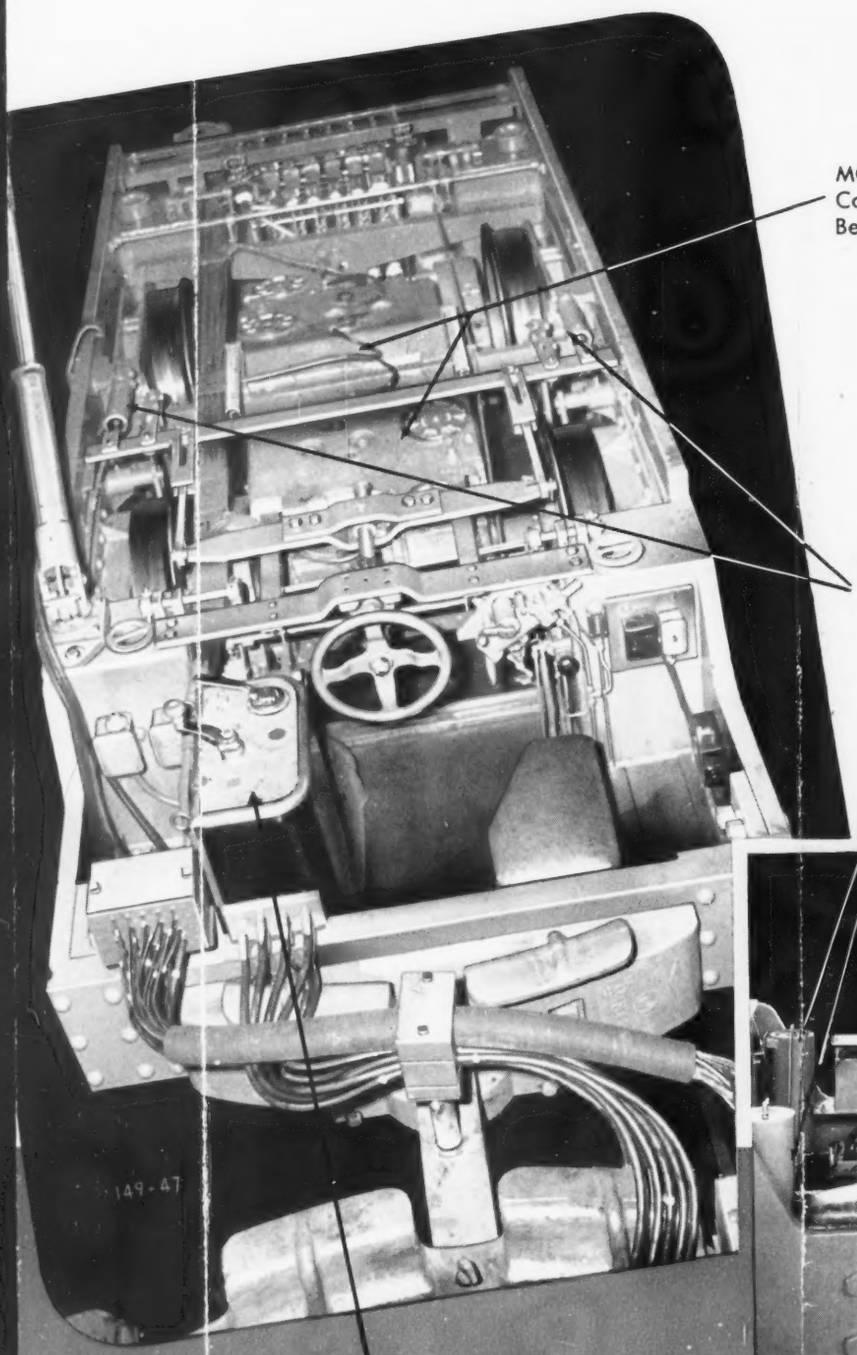
CONTACTORS — Eliminate destructive arcing in controller by using Contactors for acceleration.

HEADLIGHTS — Open or permissible type for Gathering or main Haulage Locomotives.



CONTROLLERS — Drum, semi-magnetic or full magnetic dependent upon type of Control desired.

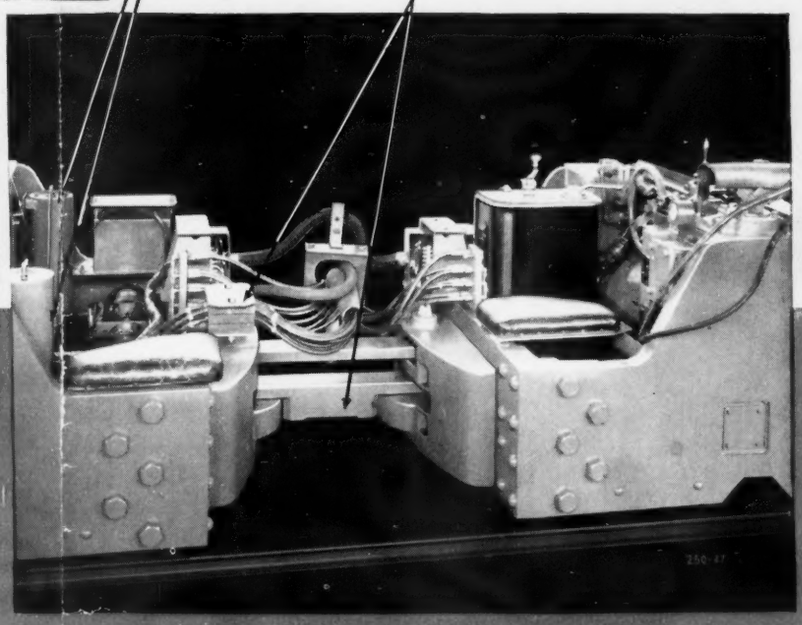
INCREASE TONNAGE . . . Connect your Locomotives in Tandem, either permanent or as separable units. Control equipment for any weight locomotive.
Rehabilitate your locomotives with standard Jeffrey Renewal Parts.



MOTOR PARTS — Armature and field Coils, Commutators and Refills, Gears, Pinions and Bearings.

HYDRAULIC BRAKES — Easily applied on Haulage Locomotives and essential on Tandems.

LOCOMOTIVES—May be separated by disconnecting Cable and Hydraulic Hose at Terminal Blocks and Hydraulic Connection Blocks.
Cross connections supported on Tandem Drawbar to provide flexibility—eliminating cable and hose breakage.



CONTROLLERS — Drum, semi-magnetic or full magnetic dependent upon type of Control desired.

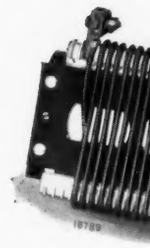
in
rol
ey

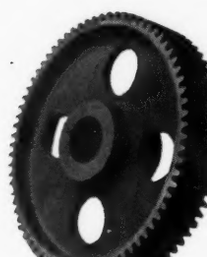
nect-
locks

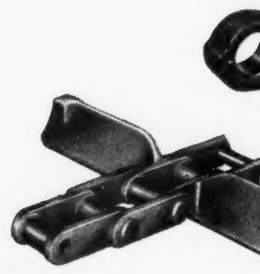
wbar
hose

Gen

RENE







enuine

JEFFREY
NEWAL PARTS

LOADIN

D
DRILLI

U
CO

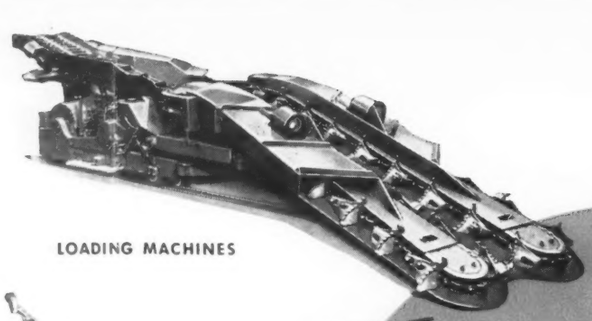
SHORT

TH

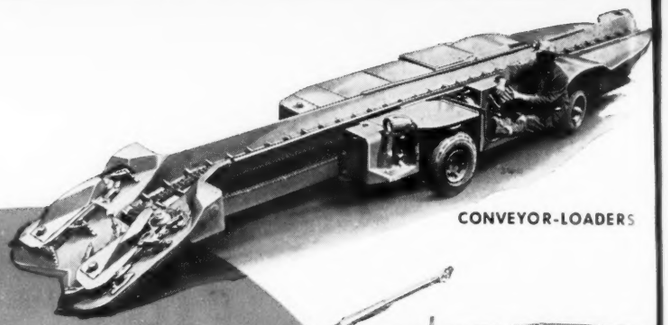
Sales O

Service

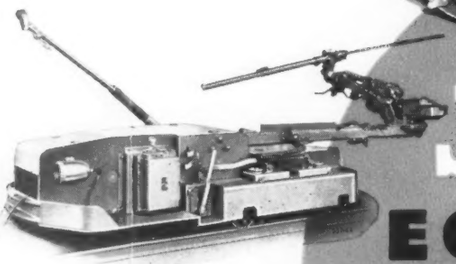
Foreign



LOADING MACHINES

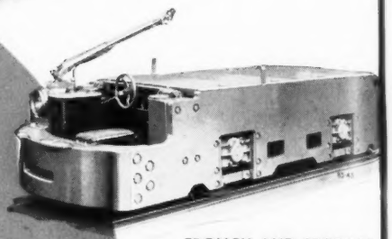


CONVEYOR-LOADERS

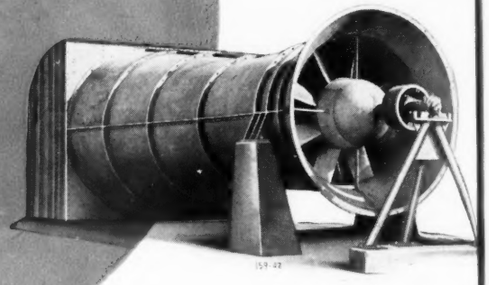


DRILLS AND
DRILLING MACHINES

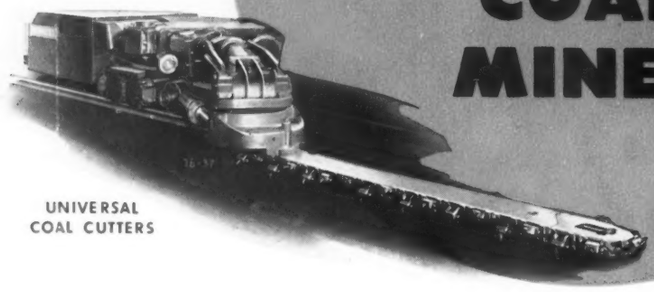
JEFFREY
EQUIPMENT
FOR
COAL
MINES



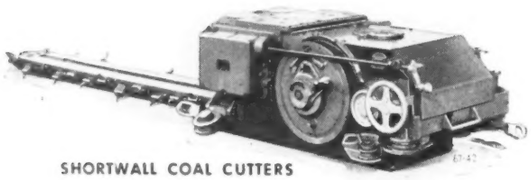
TROLLEY AND STORAGE
BATTERY LOCOMOTIVES



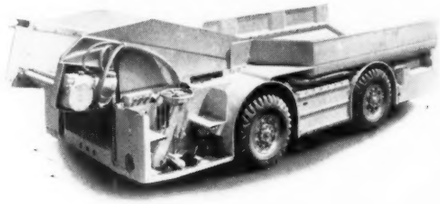
FANS AND BLOWERS



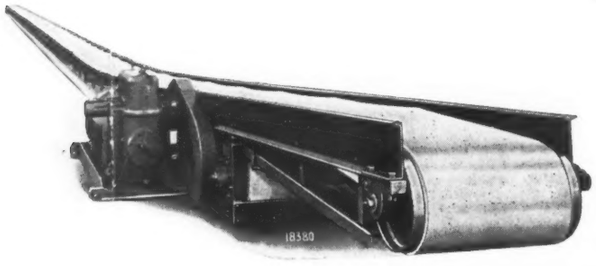
UNIVERSAL
COAL CUTTERS

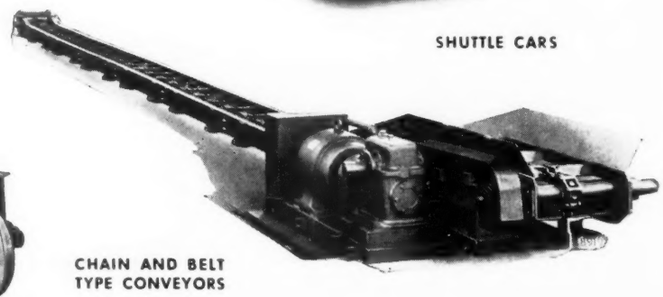


SHORTWALL COAL CUTTERS



SHUTTLE CARS





CHAIN AND BELT
TYPE CONVEYORS

AND GENUINE RENEWAL PARTS

THE JEFFREY MANUFACTURING COMPANY

Established in 1877

912-99 NORTH FOURTH STREET, COLUMBUS 16, OHIO

Sales Offices: Baltimore, Birmingham, Boston, Buffalo, Chicago, Cleveland, Cincinnati, Detroit, Denver, Harlan, Houston, Huntington, Jacksonville, Milwaukee, New York, Philadelphia, Pittsburgh, Scranton, St. Louis, Salt Lake City

Service Stations: Pittsburgh, Harlan, Ky., Birmingham, Mt. Vernon, Ill., Logan-Beckley, W. Va., Scranton

Foreign Plants: Jeffrey Mfg. Co., Ltd., Montreal, Quebec; British Jeffrey-Diamond Ltd., Wakefield, England; Jeffrey-Galion (Pty), Ltd., Johannesburg, S. A.

If you are not using

DIRECT HITCHING AND STEEL MINE TIMBERS...

your mine is not as safe as it could be!

THE fact has been proved. Hitching steel timbers directly into ribs, or setting supports on steel sections hitched-in gives maximum safety from roof falls.

Not only does this "legless" form of timbering with steel timbers increase safety—it provides savings in reduced installation costs. And it eliminates frequent retimberings because of decay of legs.

There are sound reasons for steel's superiority in timbering. New steel structural sections are balanced sections with definite uniform sectional properties. They can be purchased to guaranteed minimum physical properties with uniformity throughout. They are fabricated with greater ease and with less possibility of setting up future sources of danger. They are more economical and because they weigh less than secondhand rails of equivalent strength, new steel sections minimize labor and strain in handling.

We will gladly send you the booklet—SAFE SUPPORT PROVIDED BY HITCHING AND STEEL MINE TIMBERS—without obligation on your part. The booklet contains illustrations of the various methods of installing steel timbers as well as histories of several mines using steel timbers. Write now for your free copy.

CARNEGIE-ILLINOIS STEEL CORPORATION

Pittsburgh and Chicago

Columbia Steel Company, San Francisco, *Pacific Coast Distributors*

Tennessee Coal, Iron & Railroad Company, Birmingham, *Southern Distributors*

United States Steel Export Company, New York

8-161

United States Steel Corporation Subsidiaries
2004 Carnegie Building
Pittsburgh 30, Pa.

Kindly send me without obligation, the free booklet "Safe Support Provided by Hitching and Steel Mine Timbers."

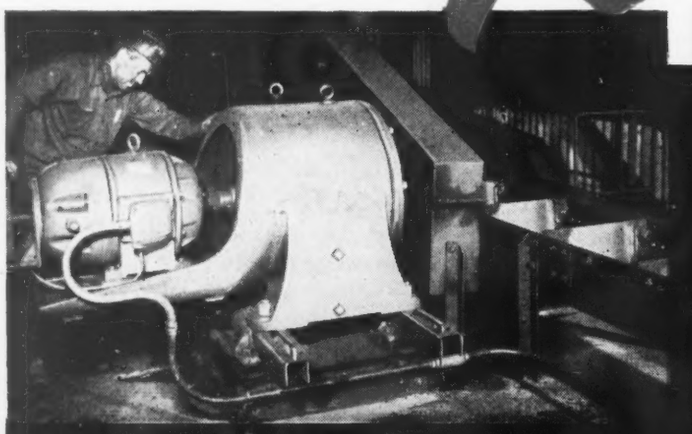
Name.....

Company.....

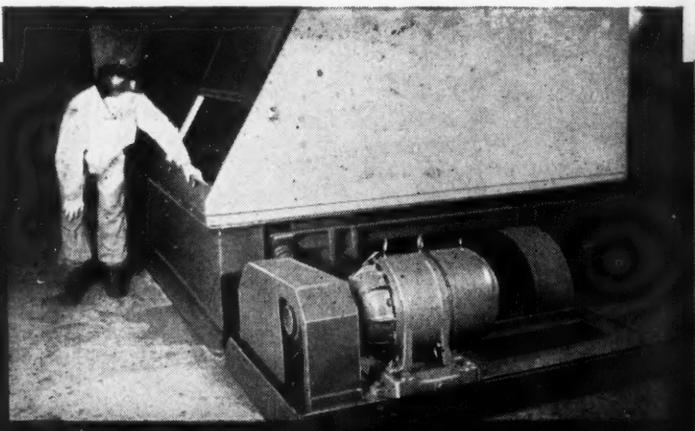
City..... State.....

UNITED STATES STEEL

Availability for Service: 100%!



▲ Here a Tri-Clad totally enclosed, fan-cooled motor drives one of the plant's conveyors. Other G-E motors run washers, vibrators, sizing screens.



▲ Here a Tri-Clad motor drives an air table. G-E motors in this plant have operated constantly with little or no maintenance, since early 1946.

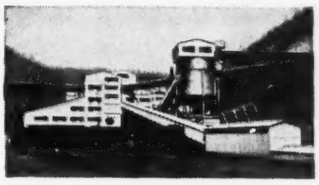
This load center unit substation is one of two 1500-kva G-E units which step down 6900-volt power to 480 volts. G-E substations ▼ are compact, ready-to-install.

GE

Equipment

...to cut coal-handling costs per ton!

In this ultra-modern colliery, G-E Tri-Clad motors work 90 hours per week, with practically no maintenance—power costs average only $.021 per ton.



Two and a half years ago, the Dorrance Colliery of the West Virginia Coal and Coke Company was put in service as part of the Company's multi-million dollar modernization program.

In choosing motors to drive the processing machinery—most of which is located in dusty atmospheres—the operators wanted maximum protection against corrosive effects and clogging action of dust and dirt, which can cause equipment shutdowns. That's why they selected General Electric totally enclosed, fan-cooled motors—more than 90% of the 200 motors installed. These G-E motors—most of them of Tri-Clad* construction—have since run up a record of *100*% service availability.

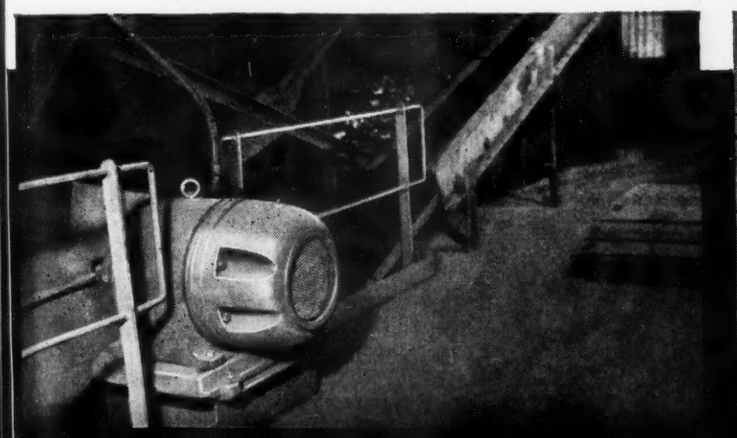
Also contributing to the colliery's high production are its modern G-E unit substations installed at strategic points to maintain operating continuity and assure full voltage at the motors.

For close co-ordination of the entire plant operation and for most efficient utilization of manpower, control of all motors is centralized in three G-E Cabinetrol* units.

As a result of the efficient use of electricity throughout the plant, the colliery handles 800 tons of R.O.M. coal per hour, and power costs have been kept down to only $.021 per ton.

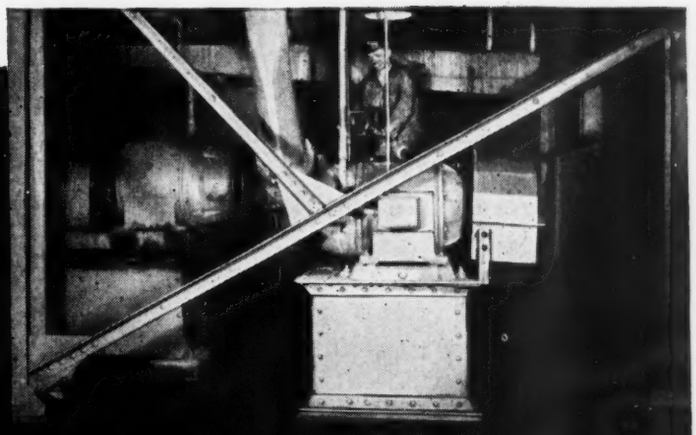
G-E engineers, thoroughly familiar with coal mining and preparation, can help you apply the properly co-ordinated electric equipment to cut your maintenance and power costs. As a first step, call the G-E office nearest you. *Apparatus Dept., General Electric Company, Schenectady 5, N. Y.*

**Reg. U.S. Pat. Off.*



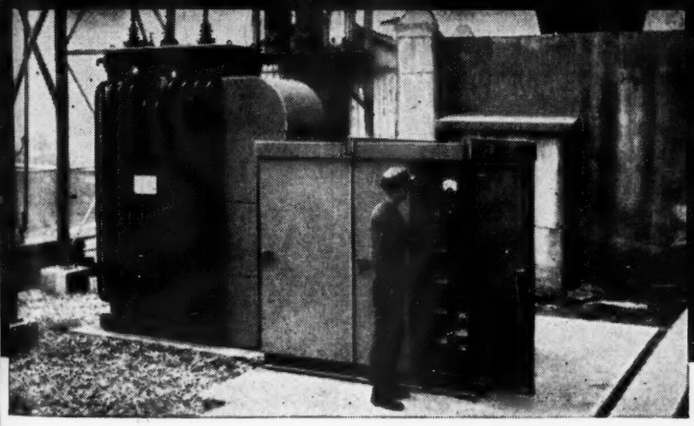
▲ Dust in the atmosphere around this shaker screen does not affect this Tri-Clad totally enclosed fan-cooled motor.

Here a 750-kva G-E unit substation, 6900-2400 volts, supplies power to a rotary converter in a drift mine as well as to an aerial tramway. ▼



▲ Only routine inspection has been needed on this colliery's G-E motors since their installation. Shown are two Tri-Clad motors in the pump room.

This G-E Cabinetrol assembly is one of three master control sections in the plant. G-E metal-clad motor-starter units protect personnel, save installation time. ▼



GENERAL ELECTRIC

657-69

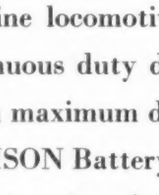
BELOW: cutaway view of typical EDISON cell used in mine haulage batteries.

Why EDISON *Batteries* LAST LONGER

WHAT enables an EDISON Battery to stay on the job, out of the repair shop—to see a mine locomotive or shuttle car through its strenuous duty day after day, year after year with maximum dependability? What makes an EDISON Battery give long life and low haulage cost in spite of the hardest usage?

One of the many answers is its rugged, precise cell construction. Cell containers, covers, pole pieces and other structural parts are made of STEEL. Even the active materials are permanently locked in perforated STEEL tubes and pockets. These in turn are securely assembled into STEEL grids to form the negative and positive plates. Every STEEL cover is welded to its container, proof that no internal trouble is anticipated for the normal life of the cell.

Case histories show that EDISON Batteries in mine haulage service have fallen down shafts and gone through many wrecks with little or no damage . . . *and still delivered their full service life.* The fact that they can withstand such accidents indicates the extra dependability that can be expected of them under more normal conditions.



EDISON
Nickel • Iron • Alkaline
STORAGE BATTERIES

ADVANTAGES OF EDISON NICKEL-IRON-ALKALINE BATTERIES:

They are durable mechanically; can be charged rapidly; withstand temperature extremes; are foolproof electrically; can stand idle indefinitely without injury; are simple and easy to maintain.

EDISON STORAGE BATTERY DIVISION OF THOMAS A. EDISON, INCORPORATED, WEST ORANGE, N. J.
In Canada: International Equipment Company, Ltd., Montreal and Toronto

YOU GET 3 Big Service Extras

—when you buy a NEW GM "71" Diesel Engine

1. *Installation Inspection:*

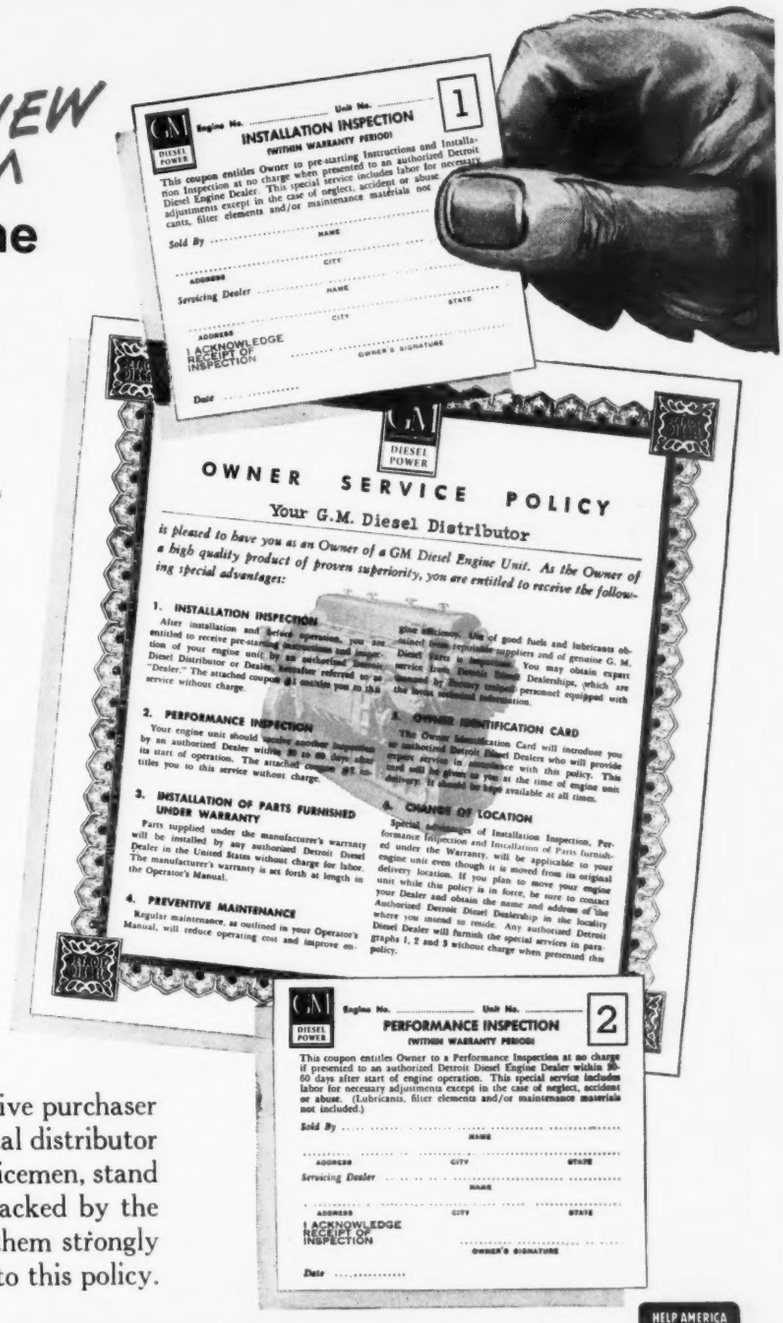
The GM Diesel representative inspects and checks the engine without cost to the owner; whenever possible this is done before the engine is put to work. He explains how to successfully operate the engine and the "preventive maintenance" necessary for best results in days to come.

2. *Performance Inspection:*

From thirty to sixty days after the engine has begun its job, another inspection is provided without charge. The GM Diesel representative makes any adjustments that may be required and tunes up the engine to its best performance.

3. *Owner's Service Policy:*

Besides the above inspections, GM Diesel owners are protected by an exceptional warranty outlined in the owner's service policy.



WE WANT every purchaser or prospective purchaser of one of our engines to know how his local distributor and dealer, with their factory-trained servicemen, stand back of the product. They in turn are backed by the knowledge that Detroit Diesel supports them strongly in their adherence to this policy.

GM
GENERAL MOTORS
DIESEL POWER

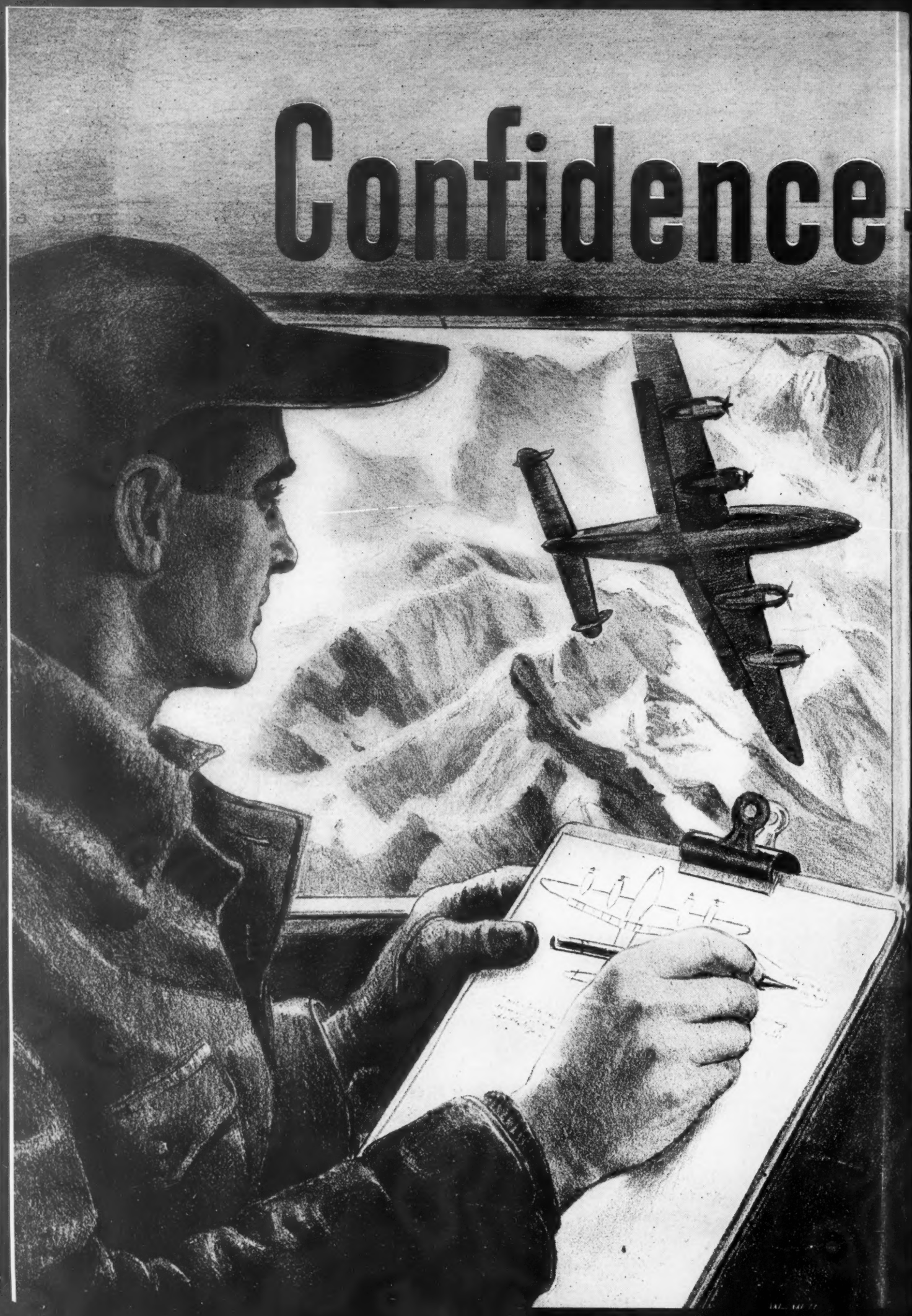
DETROIT DIESEL ENGINE DIVISION

SINGLE ENGINES.. *Up to 200 H.P.* **DETROIT 28, MICHIGAN** MULTIPLE UNITS.. *Up to 800 H.P.*

GENERAL MOTORS

HELP AMERICA PRODUCE FOR PEACE
Turn in SCRAP

DIESEL BRAWN WITHOUT THE BULK


Confidence

WITH ITS SLEEVES ROLLED UP!

YEAR BY YEAR, planes grow bigger . . . faster and safer. Man has unbounded confidence in his ability to build better and better planes. Never satisfied, he experiments and tests tirelessly, and aviation progresses.

With similar vision and confidence, Roebling has been pacemaker in the development and manufacture of products essential to the transportation and other industries. The active, widespread confidence it has won among technical men and operators throughout industry is Roebling's proudest asset.

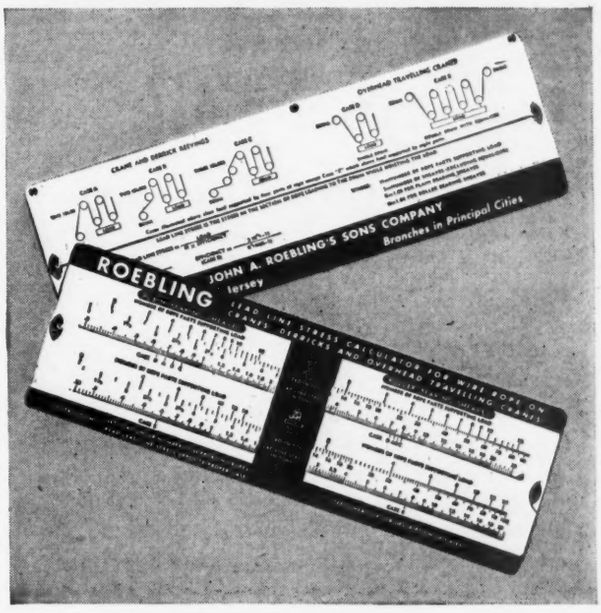
Look to Roebling for continued leadership . . . continual improvement in its products and engineering . . . continual progress.

WHAT SIZE ROPE? HERE'S YOUR ANSWER—FREE

DATA used by Roebling engineers themselves are embodied in this unique "slide rule". It's the Roebling Lead Line Stress Calculator for wire rope . . . tells you in a moment the safe and economical size of rope for every load . . . gives the right answer for all types of crane, derrick, and overhead traveling crane installations.

Here's information you can accept and act upon with complete confidence . . . just as you can specify Roebling "Blue Center" Steel Wire Rope for unsurpassed toughness, dependable reserve strength and the reduction of costly replacement shut-downs. Roebling was America's first wire rope maker, and "Blue Center" Steel Wire Rope is the finest that Roebling knows how to make.

Write for a Roebling Lead Line Stress Calculator—it's free. And let your Roebling Field Man tell you about installation and maintenance practices that prolong wire rope life. Call him at your nearest Roebling branch office.



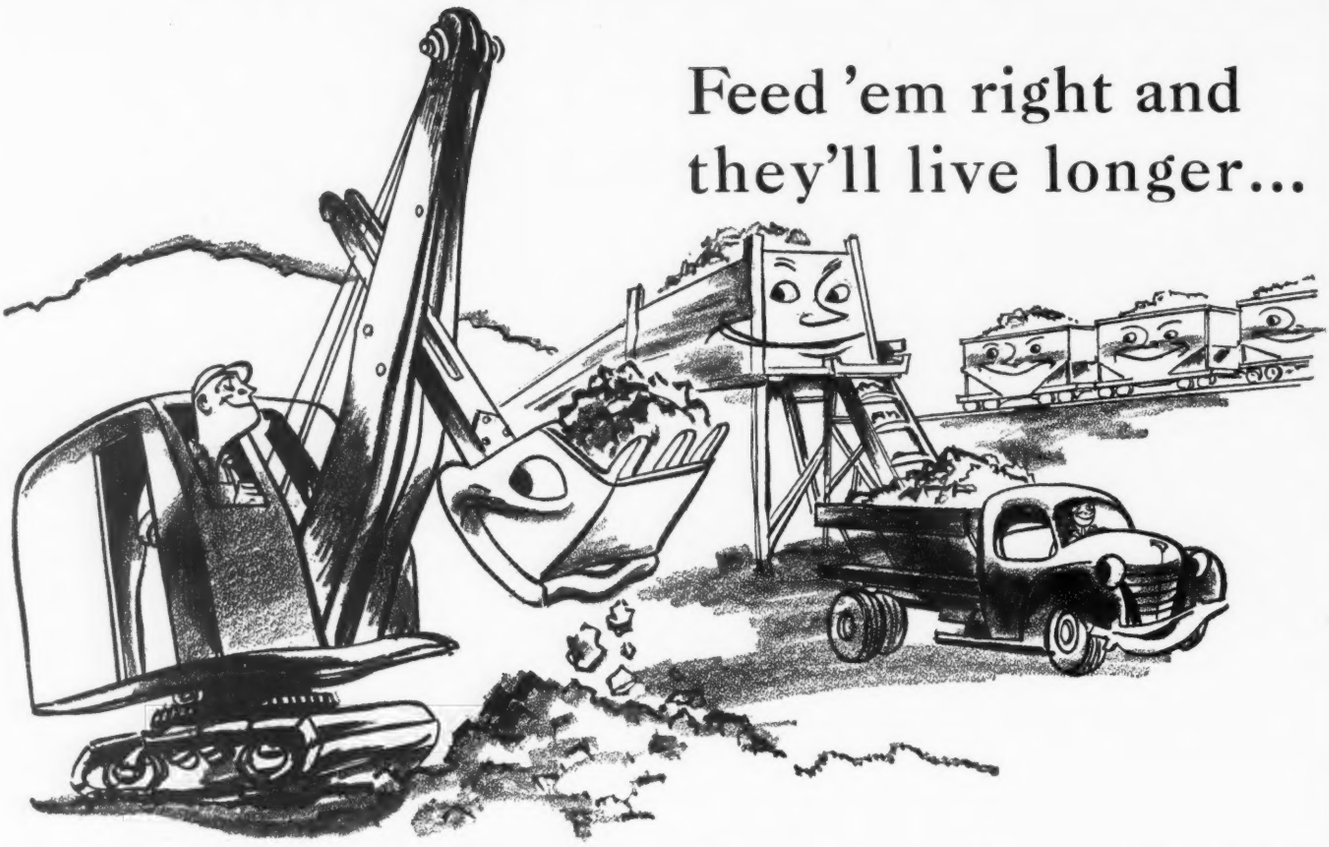
JOHN A. ROEBLING'S SONS COMPANY
TRENTON 2, NEW JERSEY
Branches and Warehouses in Principal Cities

★ *WIRE ROPE AND STRAND* ★ *FITTINGS* ★ *SLINGS* ★ *SUSPENSION BRIDGES AND CABLES* ★ *AIRCORD, AIRCORD TERMINALS AND AIR CONTROLS* ★ *AERIAL WIRE ROPE SYSTEMS* ★ *ELECTRICAL WIRE AND CABLE* ★ *SKI LIFTS* ★ *HARD ANNEALED OR TEMPERED HIGH AND LOW CARBON FINE AND SPECIALTY WIRE, FLAT WIRE, COLD ROLLED STRIP AND COLD ROLLED SPRING STEEL* ★ *SCREEN HARDWARE AND INDUSTRIAL WIRE CLOTH* ★ *LAWN MOWERS*

ROEBLING

A CENTURY OF CONFIDENCE

JR ROEBLING



Feed 'em right and they'll live longer...

ROCKMASTER Better Breakage is Better Bucket Food

Breakage, too, is a matter of digestion—for your removal equipment. That's another reason why it pays to use the Rockmaster Blasting System. Rockmaster's better breakage pays off in longer equipment life and speedier handling in quarries, strip pits and mines.

Buckets bite into more evenly broken, smaller rock—and that means less strain on your shovel's powerhouse as well as on the bucket itself. Loaders, mine cars, trucks, all carry heavier loads under lighter strain. Big rocks that require secondary blasting are cut to a minimum. It's full speed ahead after a Rockmaster millisecond delay blast.

Rockmaster is the original millisecond delay blasting system—pioneered by Atlas. No special equipment is needed. For some operators, Rockmaster methods have saved tens of thousands of dollars a year. Your Atlas representative will gladly discuss ways that Rockmaster can be of help to you in your mining, quarrying and construction work. Call him today.

THE GREATER SAFETY OF ATLAS MANASITE DETONATORS

Less Bark

More Bite

Remember, the Atlas Rockmaster Blasting System also incorporates Atlas Manasite. This means decreased sensitivity to impact and friction — no sacrifice in efficiency but less chance of accident.

"ROCKMASTER"—Trade Mark
Manasite: Reg. U. S. Pat. Off.

ATLAS EXPLOSIVES
"Everything for Blasting"

CHEMICALS ATLAS EXPLOSIVES

ATLAS POWDER COMPANY, Wilmington 99, Del. • *Offices in principal cities* • *Cable Address—Atpowco*

Engineered and Built for the GREAT ESSENTIAL . . .

Unfailing Light

at the Working Place

EDISON

ELECTRIC CAP LAMPS

Effective cooperation among men is fundamental for high production . . . and the great equipment essential for better teamwork underground is *unfailing light* on the job . . . EDISON Light . . . brilliant, powerful, better directed at the work, always completely dependable. Check Edison Electric Cap Lamp performance under your own conditions—*let us arrange an actual demonstration!*

M·S·A

MINE SAFETY APPLIANCES COMPANY

BRADDOCK, THOMAS AND MEADE STREETS . . . . . PITTSBURGH 8, PA.

District Representatives in Principal Cities

In Canada

MINE SAFETY APPLIANCES COMPANY OF CANADA LIMITED

TORONTO . . . MONTREAL . . . CALGARY . . . WINNIPEG . . . VANCOUVER . . . NEW GLASGOW, N. S.

SOUTH AMERICAN HEADQUARTERS
Casilla 733, Lima . . Agents in Principal Cities

MINE SAFETY APPLIANCES CO. (S.A.) (PTY) LTD.
Johannesburg, South Africa N'Dola—Northern Rhodesia

Take a WALWORTH No. 225P Bronze Valve Apart...

COMPARE IT PIECE BY PIECE

It will pay you to look inside the Walworth No. 225P. Compare the improved design, construction and convenience features shown in the "exploded" view. Notice the husky bronze body, the removable seat and disc, the oversize stem, all assuring maximum protection against wear and leakage.

Further, No. 225P is the TOUGHEST bronze valve your money can buy. The stainless steel, noncorrosive seats and discs are heat treated to a hardness of 500 Brinell – hard enough to scratch glass and crush nails. For this reason, the valve can be closed on sand, slag, scale and similar flotage without injury to the seating surfaces, and "wire drawing" is practically eliminated. Thus years of tight, positive shut-off are assured.

Available in both globe and angle types (angle type: No. 227P) in sizes ¼" to 2", this quality valve is recommended for 350 lbs. W.S.P. at 550 F, and 1000 lbs. non-shock service on cold water, oil, gas or air.

For full data on this long-life, economical Walworth Bronze Valve, see your local Walworth distributor, or write for Circular 82.

WALWORTH

valves and fittings

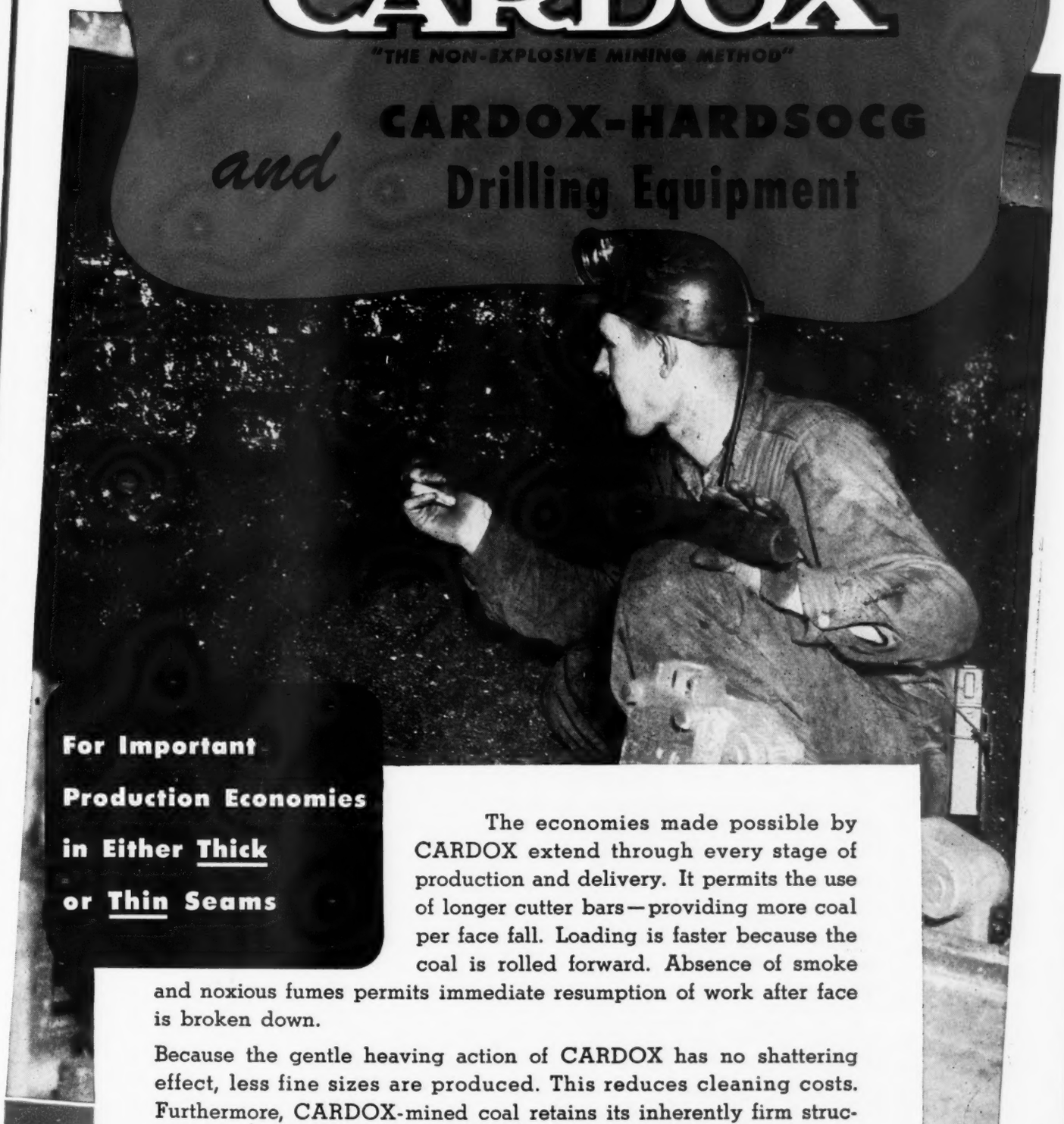
60 EAST 42nd STREET, NEW YORK 17, N. Y.

DISTRIBUTORS IN PRINCIPAL CENTERS THROUGHOUT THE WORLD

CARDOX

"THE NON-EXPLOSIVE MINING METHOD"

CARDOX-HARDSOCG and Drilling Equipment



For Important Production Economies in Either Thick or Thin Seams

The economies made possible by CARDOX extend through every stage of production and delivery. It permits the use of longer cutter bars—providing more coal per face fall. Loading is faster because the coal is rolled forward. Absence of smoke and noxious fumes permits immediate resumption of work after face is broken down.

Because the gentle heaving action of CARDOX has no shattering effect, less fine sizes are produced. This reduces cleaning costs. Furthermore, CARDOX-mined coal retains its inherently firm structure. For this reason it can be subjected to extensive mechanical handling, be shipped long distances by train, boat or truck without excessive degradation. Write for full details on free demonstration.

CARDOX CORPORATION • BELL BUILDING • CHICAGO 1, ILLINOIS

NO PLANT SHUTDOWNS
due to hauling failures

. . . when you haul with WALTER TRACTOR TRUCKS

● Walter Tractor Truck with 30-ton bottom dump trailer.

"Weather-proof" HAULING

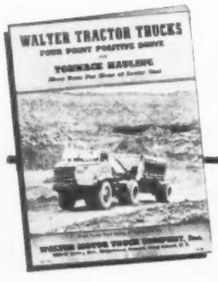
The exclusive Walter 4-Point Positive Drive provides great power and unfailing traction to haul 30, 40 up to 60 ton payloads at good speeds—without bogging down or stalling on soft ground, slippery surfaces or steep grades.

Three patented automatic locking differentials act as a "mechanical brain", insuring a positive drive to all four wheels, without wheel spinning. This minimum of wheel slippage, and reduced wheel bouncing due to proper spring action and weight distribution, give 50 to 100% longer tire life and preserve mine roads.

HOW often has your plant been slowed down or shut down by the failure of trucks to keep a flow of ore moving from the pit? The most common cause is the fact that conventional "heavy duty" trucks cannot haul when the weather and running conditions get tough.

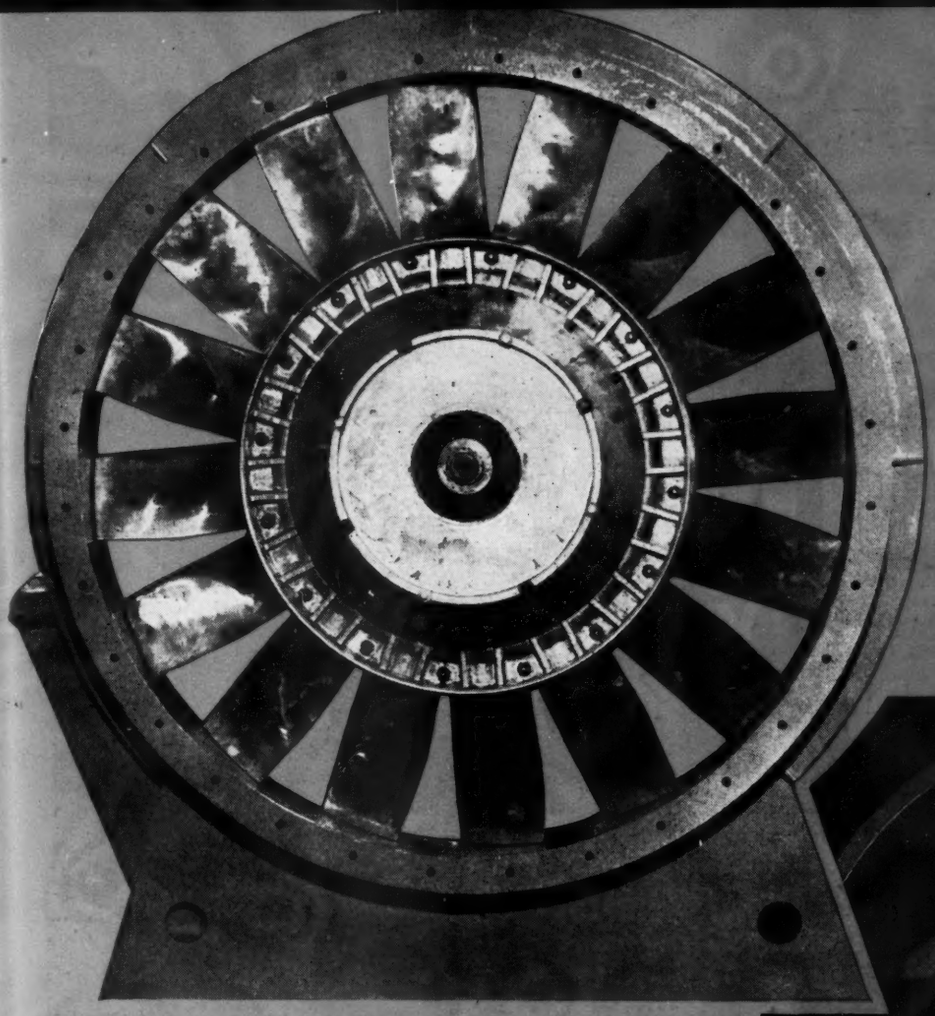
The use of big, powerful, 100%-traction Walter Tractor Trucks is insurance against such failures —and keeps your shovels and plant working at capacity, regardless of hauling conditions.

● Walter 20-ton Dumper. Fast, compact, rugged.



WRITE for Detailed Folder
"Walter Tractor Trucks
for Tonnage Hauling"
which explains the advantages of
Walter Tractor Trucks.

WALTER MOTOR TRUCK COMPANY
1001-19 IRVING AVE., RIDGEWOOD 27, QUEENS, L. I., N. Y.



Blades are interlocking—simultaneously adjustable—providing a quick, simple method of adjustment to meet changing air demands.

Permanent bearing alignment assured and foundation work simplified by a sturdy steel base which stiffens integral rotor and housing unit.

LOW OPERATING SPEED

WIDE OPERATING RANGE

QUICK BLADE ADJUSTMENT

EASE OF INSTALLATION

LOW COST MAINTENANCE

Consult a Joy Engineer

WAD CL 1382

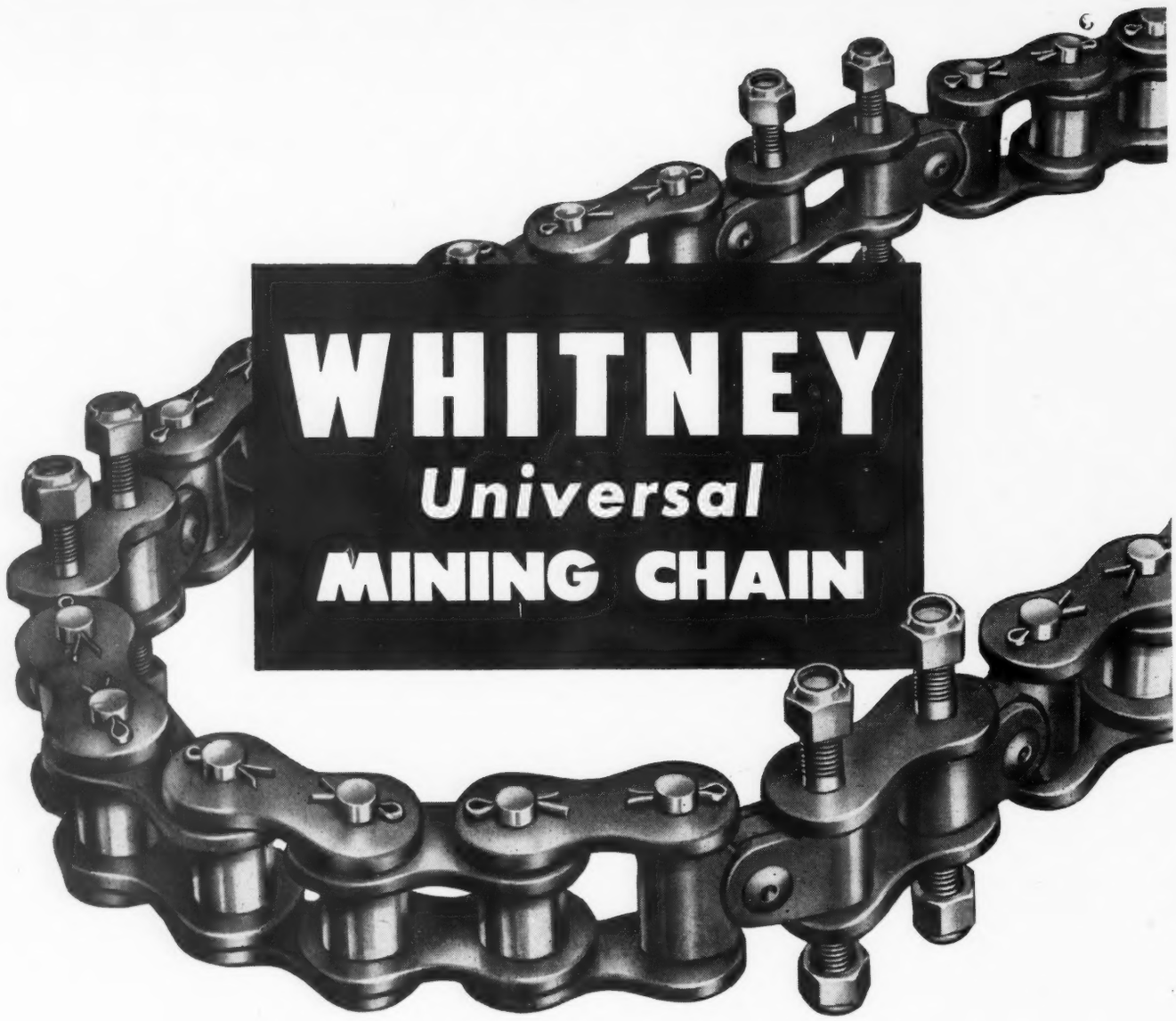
JOY AXIVANE MINE FANS

Troller designed

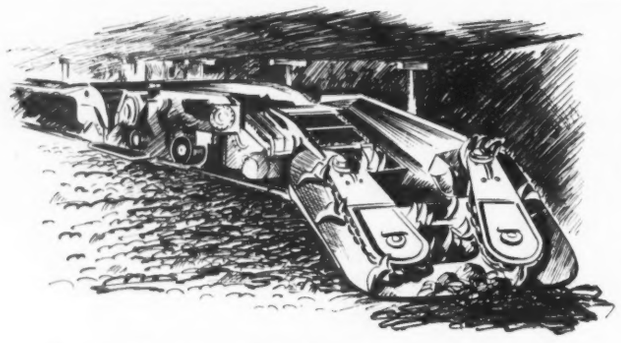
LA-DEL DIVISION

JOY MANUFACTURING CO.

GENERAL OFFICES: HENRY W. OLIVER BUILDING · PITTSBURGH 22, PA.



will Cut Costs and Boost Tonnage



You can be sure of continuous, up-at-the-face production if your mechanical loaders are equipped with Whitney Universal Mining Chain. This rugged, dependable chain is especially designed to give long, trouble-free service under the severest of mining conditions.

All link parts are made of alloy steel, heat treated for extreme toughness and durability. The universal joints are alloy steel forgings, accurately machined. Flight studs are fully machined with milled threads. End pins are fully riveted into deep countersink in forgings, have maximum anchorage. These features give you the utmost in operating life . . . cut chain maintenance to the bone.

Look into Whitney Universal Mining Chains for your loaders. Investigate, too, Whitney Power Transmission Chains, Conveyor Chains and Cut Tooth Sprockets . . . the all-steel drives, built to help you build record tonnage. Write for complete information today.

Whitney Chain & Mfg. Co.

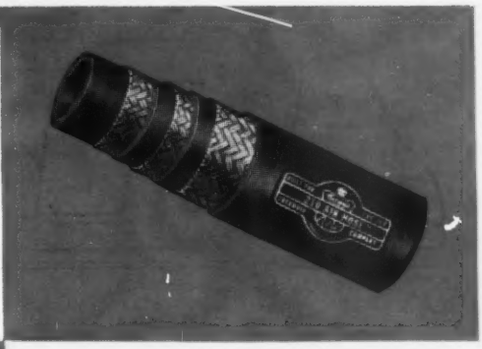
Division of Whitney-Hanson Industries, Inc.
210 HAMILTON STREET, HARTFORD 2, CONNECTICUT

Thermoid Air Hose
Tailored for the Job!

Three popular types from Thermoid's complete Air Hose Line

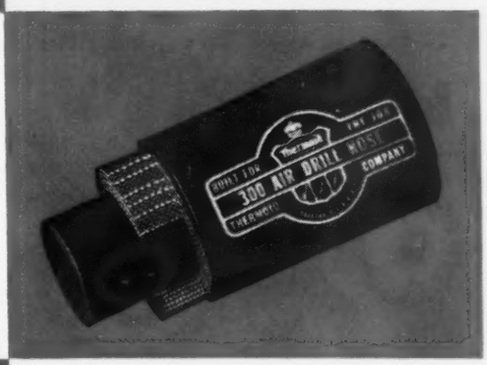
For heavy duty service where oil may be present in the air line, and cover abrasion is severe.

Thermoid #210 Type—Special Neoprene Oil-Resisting Inner Tube reinforced with tough plies of braided yarn, abrasion resisting cover—pressures up to 300 P.S.I. furnished in lengths of approximately 500 ft. in sizes ¼ to 1" and approximately 250 ft. in 1¼ and 1½".



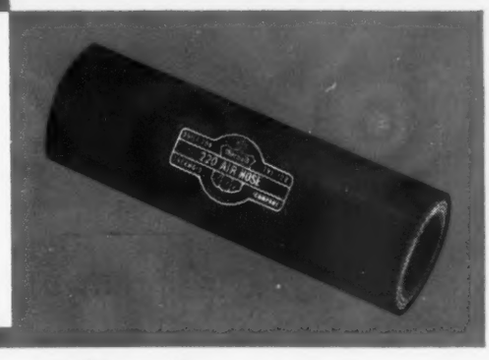
Wrapped construction—for similar heavy duty service where hose is subject to rough handling.

Thermoid #300 Type—Neoprene Tube reinforced with heavy, square woven duck, abrasion resisting cover—pressures up to 300 P.S.I. Sizes ½ to 3" in 50 ft. lengths.



For light duty air connections, blow-out work and similar service.

Thermoid #220 Type—High quality Inner Tube compounded to resist oil, tough cover. Furnished in lengths of approximately 500 ft. in sizes ¼ to 1" and approximately 250 ft. in 1¼ and 1½".



Additional types of Air Hose are available for specific services

It's good business to do business with Thermoid

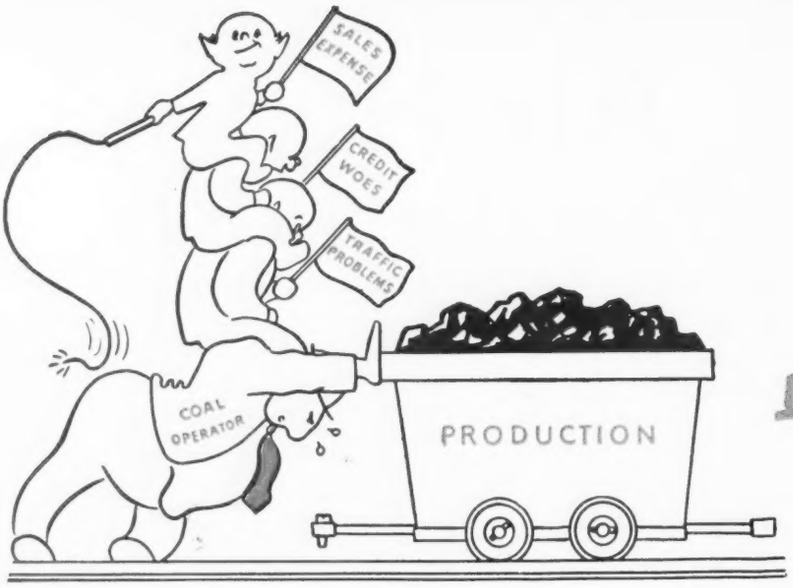
In more than 60 years of working closely with the engineers of industry, Thermoid has developed a *complete* line of Industrial Rubber Products—with the type of construction carefully worked out for every degree of service.

Thermoid distributors carry large stocks of our standard items and always work closely with the Thermoid sales engineers when their customers have special requirements to be met.

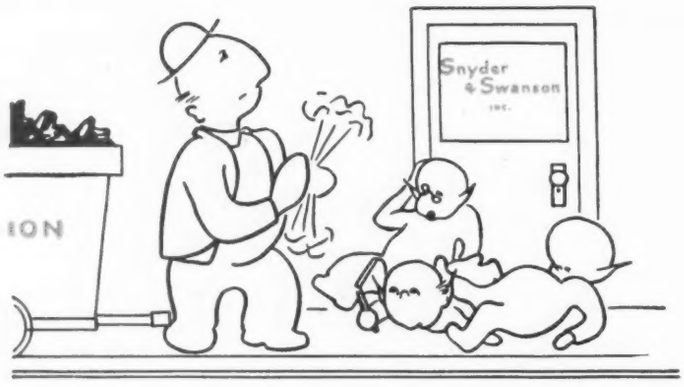
The Thermoid Line Includes: Transmission Belting · F.H.P. and Multiple V-Belts · Conveyor Belting · Elevator Belting · Wrapped and Molded Hose · Custom Molded Products · Industrial Brake Linings and Friction Materials.

Thermoid Company · Trenton, N. J., U. S. A.

Automotive · Industrial · Oil Field · Textile Products

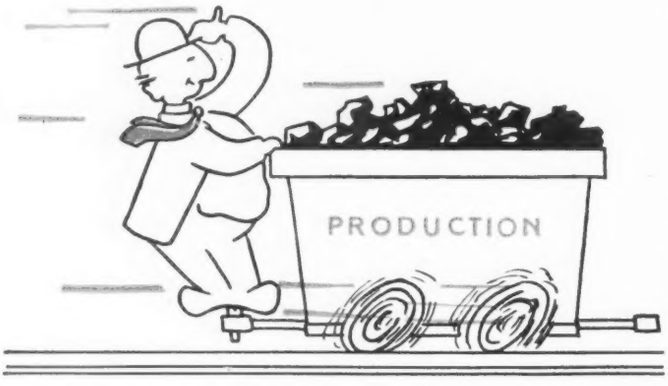


Lighten the Load!



SWITCH YOUR TROUBLES TO

Snyder & Swanson-



AND GO ON TO

Maximum Production

AND

Higher Profits

There are different ways of going on to higher profits and greater production of coal. One way is the rambling methods of the peddler . . . the other is the calculated and *engineered* COAL MERCHANDISING method. This kind of selling requires a real investment in trained personnel, as provided by Snyder & Swanson.

Snyder & Swanson INC.

SNYDER & SWANSON COAL

COAL MERCHANDISERS

Main Office: PITTSBURGH, PA.

BRANCH OFFICES

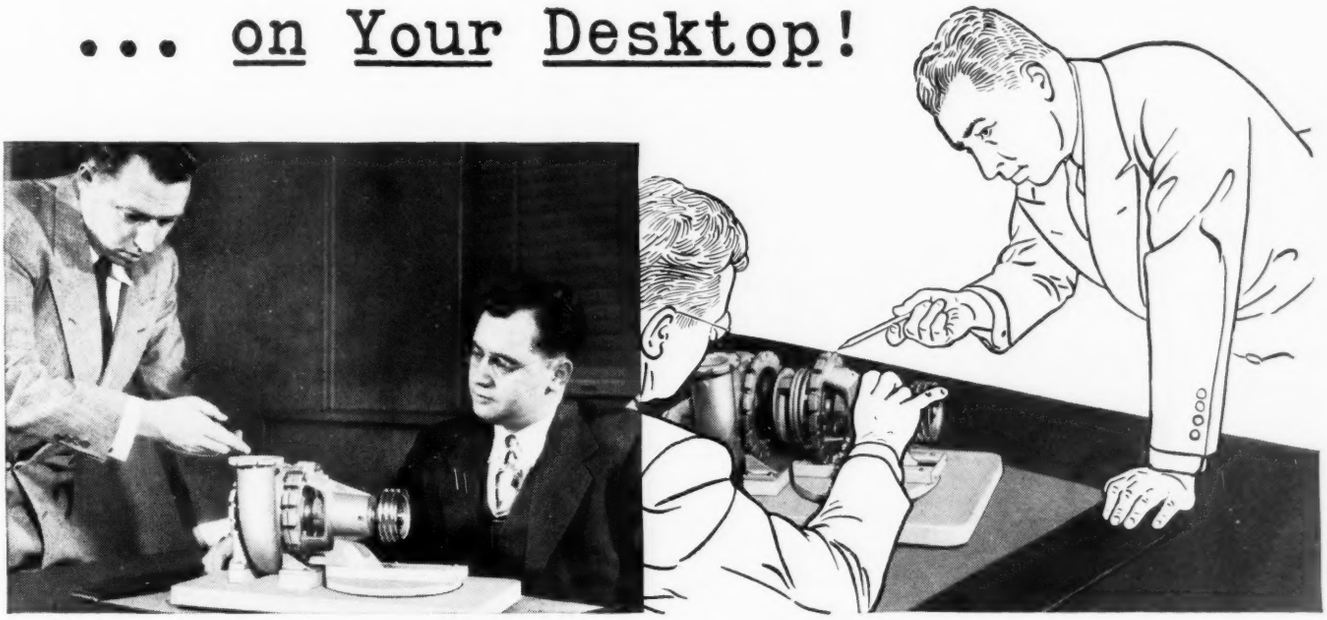
- **CLEVELAND**
- **BALTIMORE**
- **NEW YORK**

Shipment By:

RAIL · LAKE · TIDEWATER

Solids Pump Features Demonstrated

... on Your Desktop!



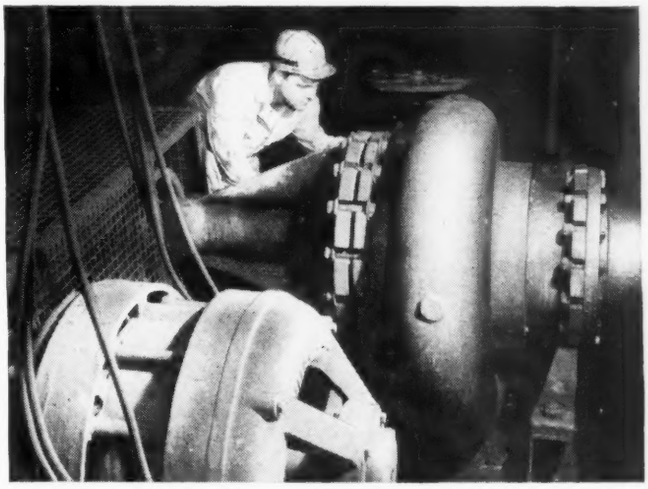
1. Easy to see . . . with this model on your desk . . . how the CW solids pump can save you big money in coal washing. It's built with *only five* working parts — all standardized and easily accessible. That means much lower parts inventory . . . time saved in disassembly!

2. Take it apart yourself — see how internal parts can be removed *without disturbing piping*. Notice the oversize shaft . . . casing and working parts made of Allisite, a special alloy for high abrasion resistance. Yes, this pump is built to last longer than you'd believe possible!

HERE ARE MAIN FEATURES OPERATORS WANT IN COAL WASHING PUMPS . . .

- High Abrasive resistance of wearing parts.
- Rotating elements accessible without disturbing the piping.
- Simple design, with easy parts replacement.
- Standardization of parts — to reduce inventory.
- Low hp requirement.
- Capacity changeable by speed adjustment . . . without having to change impeller.
- Ability of pump to deliver near rated capacity until parts are completely worn out.
- Variable discharge nozzle arrangement.
- Heavy-duty construction with oversize shaft.

— GET ALL THESE FEATURES IN ALLIS-CHALMERS' CW SOLIDS PUMP



3. In fact, survey results (see above) show that this solids pump offers most of the features wanted by experienced users! Developed by Allis-Chalmers especially for coal washing, its thoroughly sound design makes possible handling up to 40% solids in suspension efficiently.

4. Low hp requirement on the job is further proof of this pump's high efficiency design. It moves *more* solids at *less cost!* To change capacity, only the speed need be adjusted. Variable discharge nozzle arrangement makes pump suitable for cramped quarters.

GET MORE FACTS! With no obligation on your part, the A-C representative in your locality will arrange a desktop demonstration of this model solids pump. Clip the coupon NOW and send it direct to ALLIS-CHALMERS, MILWAUKEE 1, WIS.

A 2443

WRITE FOR FREE DEMONSTRATION

Allis-Chalmers Mfg. Co., Milwaukee 1, Wisconsin

☐ Yes, I would like to see this model solids pump in my office.

☐ Please send me Solids-Handling Pump Bulletin 08B6381B.

NAME.....

ADDRESS.....

FIRM.....

ALLIS-CHALMERS

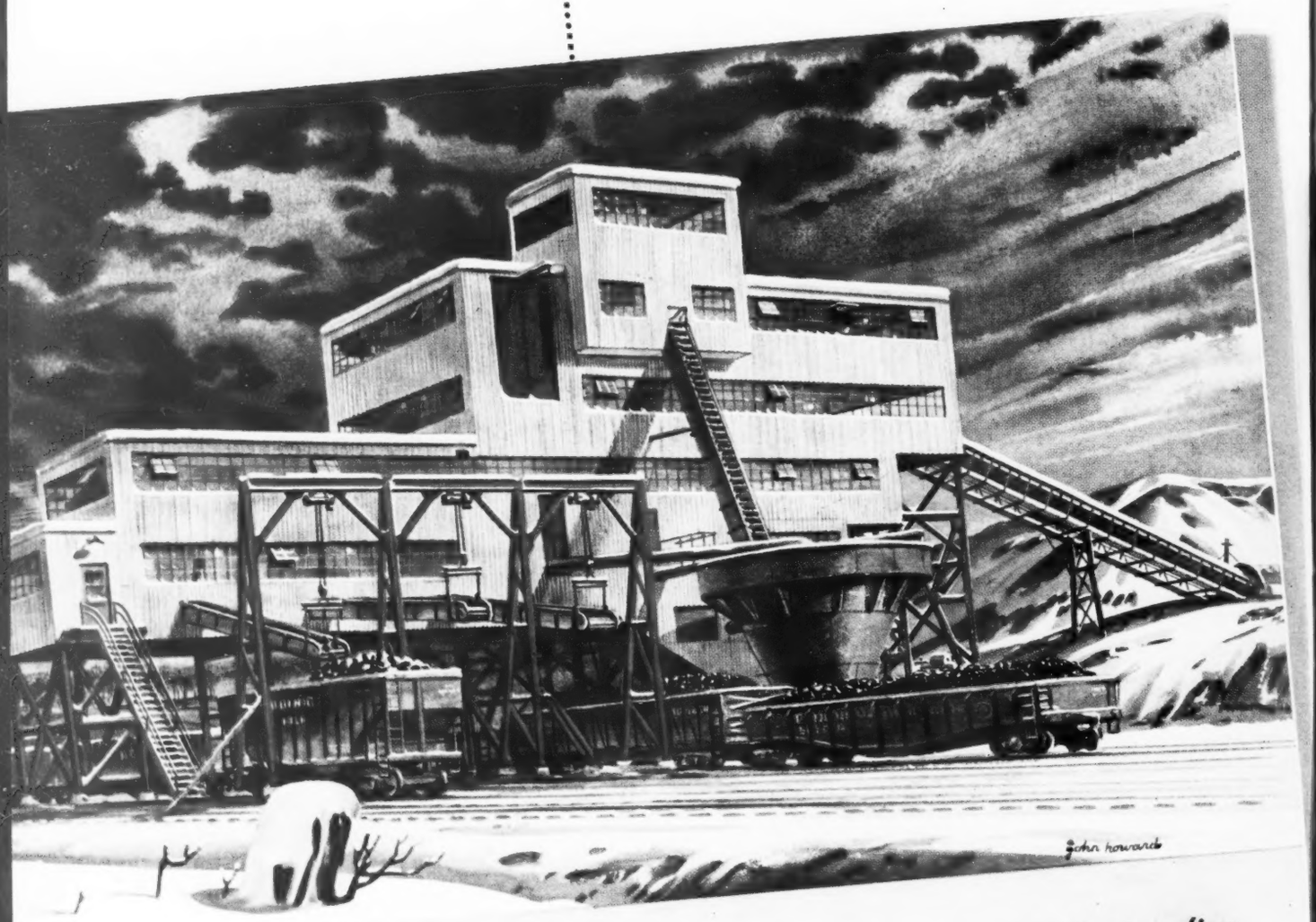
One of the Big 3 in Electric Power Equipment — Biggest of All in Range of Industrial Products

Success story for stockholders

Executives who have courageously built preparation plants to wash, dry, and upgrade coal automatically . . . are rewarded when the improved product always results in increased sales and enthusiastically satisfied customers.

Today's coal buyers expect clean coal . . . especially prepared as to grade and size. They know it is the best buy for the money. Old customers ask only for a continuing supply of the improved product; prospective customers, seeking higher BTU, are quick to change their source of supply to the mine that can furnish specification fuel.

And the improved profit situation shows up, again, to great advantage in the annual report to stockholders . . . for example, as shown below.



Our new Caney Creek 200 T.P.H. *Washery — accounts for more profitable operation*

This year has been one of expansion. The completion of our modern coal preparation plant already has proved to be a wise investment. Our raw coal, which has a high ash content, is now freed from impurities by automatic preparation in our new plant. Every hour 200 tons are transformed into "specification fuel" . . . the high-grade coal that today's coal buyers want.

This new plant provides improved, laborsaving facilities which are an incentive for workers to set new production records. Production Department can now meet increased tonnage demands. Sales Staff can satisfy present users and supply new customers who know that premium-priced fuel is the best value for their coal dollar.

Preparation Plant, pictured above, of the Caney Creek Mining Company, Incorporated, Caney Creek, Kentucky,

DESIGNED, MANUFACTURED, AND ERECTED BY

McNALLY PITTSBURG

MANUFACTURERS OF EQUIPMENT TO MAKE COAL A BETTER FUEL

Production story for men at the mines

It's a story that bears telling. When Kentucky Number 11 coal that is not merchantable in its raw state can be elevated to a product that is in actual demand, a real production beneficiation record has been established.

New marketable mixtures are blended in the plant's complete flexible Blending Facilities. "Orphan" grades are recirculated: elevated to premium stoker grades for loading; sales departments and customers are completely satisfied. Yes, it's a story of an improved product that enables the operators to continue in business at a profit.

THE McNALLY-NORTON COAL WASHER

The heart of the coal preparation plant is the washer. The McNally-Norton, shown here, stands, today, as America's 3 to 1 favorite. It separates coal and refuse with greatest accuracy. It is responsible for maximum recovery of coal which formerly went to the refuse pile. Output is uniformly clean under all conditions of feed.

Completely Automatic

Automatic mechanical controls provide accuracy. Specific gravity is changeable to any predetermined value. Producer can guarantee premium coal of specified ash content. Washes sizes to 8 inches.

Power consumption is small. Parts accessible for inspection.

Reproduced above is a page from the McNally Pittsburg book entitled, "New Horizons for Coal." On this page the McNally-Norton Coal Washer is illustrated and very briefly described. If you would like to have more details about the McNally-Norton Washer, ask for Bulletin Number 216.

The technical staff responsible for the development of McNally Pittsburg equipment will be glad to consult with you.

McNALLY PITTSBURG

MANUFACTURERS OF EQUIPMENT TO MAKE COAL A BETTER FUEL

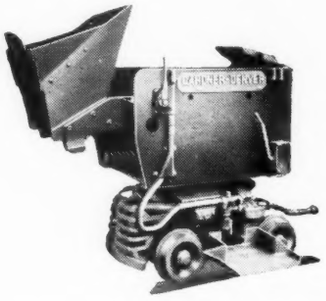
McNally Pittsburg Manufacturing Corporation—*Manufacturing Plants:* Pittsburg, Kansas • Wellston, Ohio
Engineering & Sales Offices: Pittsburg, Kan. • Chicago (1), Ill. • Pittsburgh (22), Penna. • Wellston, Ohio • Caixa Postal 1310, Rio de Janeiro, Brazil

TEAMMATES FOR TONNAGE

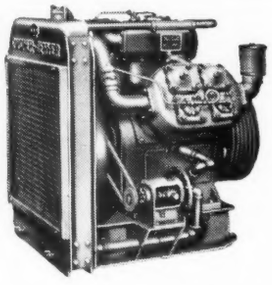
Teamwork between men and equipment gets coal out faster—at less cost. And when you use Gardner-Denver Rock Drills, Compressors and Loaders, you are sure of the *right* teammates for the job. Backed by nearly ninety years of manufacturing experience, these Gardner-Denver machines are your assurance of better mechanization for increasing tonnage.

The new lightweight Gardner-Denver R94 Self-Rotating Stoper—weighing only 100 pounds—combines high drilling speed with powerful 4-pawl rotation. A fine balance is maintained between drilling speed and power of feed. Held in any position, this drill will not "nose dive."

A fast, powerful drill, the 31-pound Gardner-Denver S33 Sinker is light enough for work in places difficult to reach. Ruggedly built for tough service, the S33 is an easy riding drill with exceptional hole cleaning ability.



Two 5-cylinder radial air motors—functioning together—give this "Big Bite" GD14 Mine Car Loader extra power on the crowd. Adjustable swing stops assure a wide clean-up range. Extremely low center of gravity gives maximum stability on the tracks—no matter how big the "bite."



Remarkably compact, Gardner-Denver "WB" Vertical Water-Cooled Two-Stage Compressors have an air output comparable to that of large horizontal compressors. Two small water-cooled cylinders—instead of a single large one—produce lower air temperatures . . . reduce inertia loads.

For complete information, write Gardner-Denver Company, Quincy, Illinois

GARDNER-DENVER SINCE 1859

WHY USE TWO
WHEN ONE WILL DO!

The "*Dual Duty*" Mine Locomotive

. . . . . *low speed for gathering*

. . . . *high speed for secondary haulage*

For the first time, a locomotive has been developed to do both of these jobs efficiently. One locomotive . . . the new Westinghouse "*Dual Duty*" mine locomotive . . . to perform all tractive service from the face to the main haulage siding. It's your sure bet for increasing efficiency and lowering operating costs.

When the locomotive is operating behind the loading machine from reel, low speed is necessary due to the short length of each movement . . . and the temporary tracks. Under this condition, the motors operate at maximum field strength to develop maximum tractive effort at low speed . . . with minimum power consumption.

When operating from trolley on more permanent tracks, in secondary haulage service, the motor field's power may be changed to obtain an increase in speed of approximately 40%, thus enabling the locomotive to make the longer movements at an economical speed—all this with no extra operations by the motorman.

Call your nearest Westinghouse office for full details, or write Westinghouse Electric Corporation, P. O. Box 868, Pittsburgh 30, Pennsylvania. J-15130

Westinghouse

PLANTS IN 25 CITIES . . . OFFICES EVERYWHERE

Mine Locomotives

5 PITS serviced by West Virginia–

THE West Virginia-Pittsburgh Coal Company is using a high-speed, rubber-tired C Tournadozer to maintain five widely separated pits of the Locust Grove mine at Collier, W. Va. Tournadozer cleans up around 5 shovels in the 5 pits, cleans the coal seam in each, levels spoil, clears snow from haul roads and works as an all-round utility dozer . . . travels job-to-job and pit-to-pit at 15 m.p.h.

5 hour Crawler trip in 30 min.

Track-type tractors, required 5 hours to travel from pit # 5 to tipple over back roads open to crawler use. ***Tournadozer, traveling a shorter route ...8 miles...via macadam roads, makes this trip in 30 minutes.***

Owner says *TOURNADOZER* handles 50% more spoil

F. A. Howe, owner, says, "For our kind of work, it does a good job anyplace we put it . . . will doze about 50% more spoil than a crawler. Last winter it did a swell job cleaning a 10-inch snow from our roads . . . in considerably less time than a tractor. Due to its speed and mobility, it can work all of our pits . . . saves us one to two tractors."

Operator likes its speed... comfort

J. Ross Denham, of St. Clairsville, Ohio, likes the easy-riding 180 h.p. Tournadozer. "You don't get that 'old jar' . . . it's fast on dozing spoil . . . can make 1½ cleaning passes to a dozer's one.

"I like the easy greasing too . . . been operating crawler dozers for 20 years and I like everything about Tournadozer . . . it's sure easy to handle . . . you can be gone while a tractor is changing gears."

Faster on any dozing job

Because of the Tournadozer's high speed, instantaneous shift, faster dozing speeds, faster reverse speeds, you get more work cycles per hour on stripping overburden, haul road maintenance or any dozing job. Because of its faster travel speed on rubber the Tournadozer handles more jobs per day.

For complete information on the revolutionary rubber-tired dozer, contact your nearest LeTourneau Distributor.

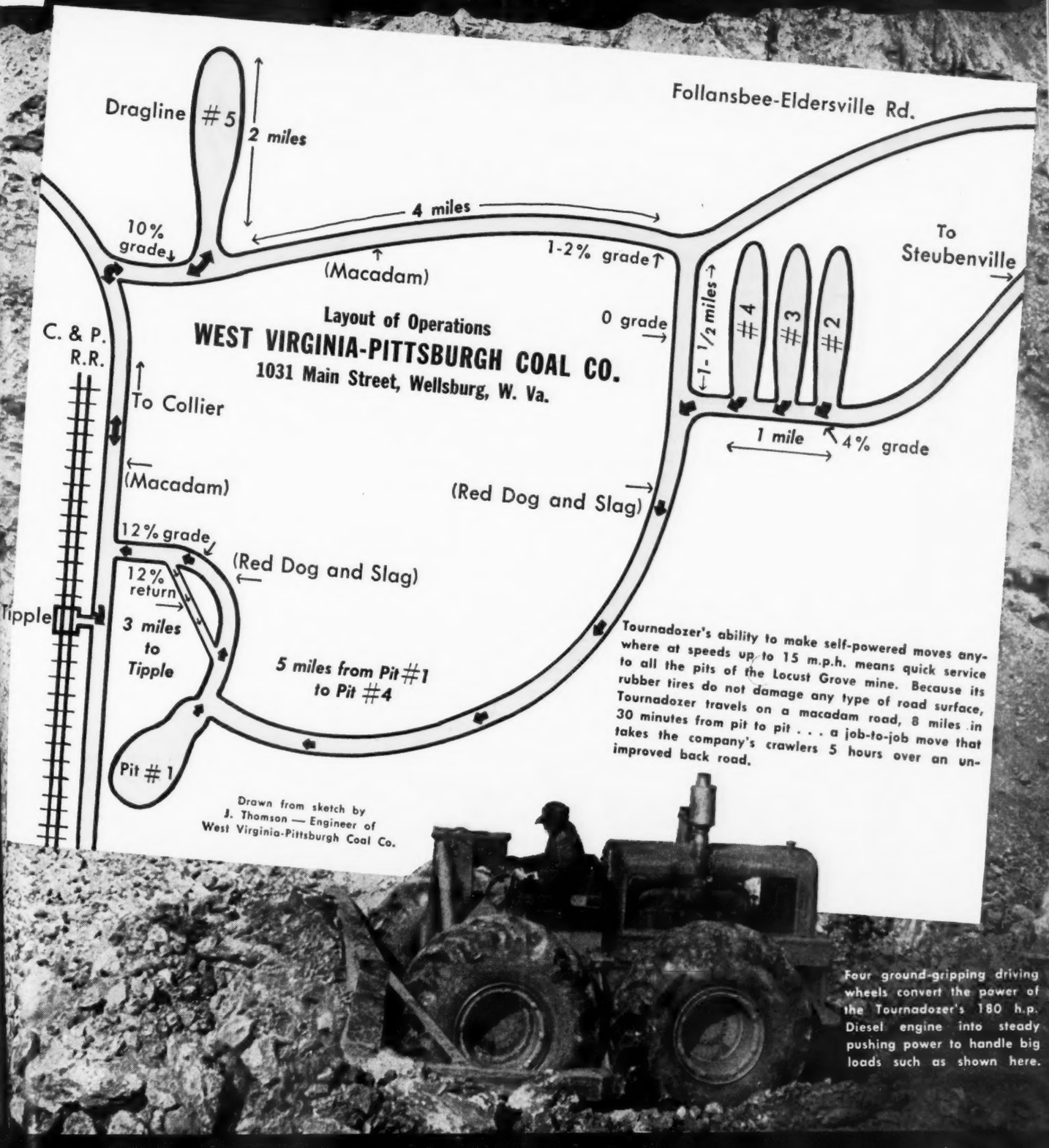
Tournadozer—Trademark CM18

Tournadozer speeds along haul road between pits and tipple . . . low pressure, giant rubber tires give plenty of traction in soft going . . . soft tires do not chew up any type of road surface.

LETOURNEAU LET EQUIPMENT

It's RUBBER THAT PUTS THE ACTION IN TRACTION . . . See your LeTourneau Distributor NOW for complete information

1 TOURNADOZER at Pittsburgh Coal Co.



Tournadozer's ability to make self-powered moves anywhere at speeds up to 15 m.p.h. means quick service to all the pits of the Locust Grove mine. Because its rubber tires do not damage any type of road surface, Tournadozer travels on a macadam road, 8 miles in 30 minutes from pit to pit . . . a job-to-job move that takes the company's crawlers 5 hours over an unimproved back road.

Four ground-gripping driving wheels convert the power of the Tournadozer's 180 h.p. Diesel engine into steady pushing power to handle big loads such as shown here.

LETOURNEAU PEORIA, ILLINOIS — HIGH-SPEED RUBBER-TIRED **TOURNADOZERS**

UNION PACIFIC

The Governor of Kansas *invites You*

STATE OF KANSAS
OFFICE OF THE GOVERNOR
TOPEKA

FRANK CARLSON
GOVERNOR

To American Industry:

Kansas has matchless and abundant resources which await only the magic touch of industry to spread their benefits to the world. Its rich soil produces the essential foodstuffs of life. Beneath the surface is stored in abundance cheap energy to turn the wheels of industry. The possibilities of rich reward are limitless.

The facilities of the State, including the active and aggressive Industrial Development Commission, are pledged to offer every encouragement and assistance in working out the problems of new industries seeking to process and distribute the great natural resources of Kansas, which furnish fertile and almost virgin soil for aggressive modern development. A thorough investigation is always welcomed. Modern transportation permits products of Kansas industry to radiate cheaply to all parts of the country.

Sincerely,

Frank Carlson
Governor

Frank Carlson

* *One of a series of advertisements based on industrial opportunities in the states served by Union Pacific Railroad.*

Unite with Union Pacific in selecting sites and seeking new markets in California, Colorado, Idaho, Kansas, Montana, Nebraska, Nevada, Oregon, Utah, Washington, Wyoming.

*Address Industrial Department, Union Pacific Railroad
Omaha 2, Nebraska

UNION PACIFIC RAILROAD

Road of the Daily Streamliners

how big is your gear scrap pile?

Genuine

PITTSBURGH

ARMORED GEARS

GUARANTEED TO EQUAL OR OUTLAST ANY OTHER HEAT TREATED GEARS

That's right . . . the Pittsburgh ARMORED GEAR Line is guaranteed to last as long or longer than any other heat treated gears made today. Further, we guarantee ARMORED GEARS to have an average service life 1 to 1½ times that of any oil treated gear . . . and to outlast untreated gears 5 times, although many service records show they last 10 to 15 times longer. And that's a fact!

For lower maintenance costs and increased output per gear-dollar spent, standardize on Guaranteed Pittsburgh ARMORED GEARS for your replacements. Most shipments made from ready stocks.

JUST THE RIGHT HARDNESS IN JUST THE RIGHT PLACES, PLUS A TOUGH, SHOCK-RESISTANT CORE!

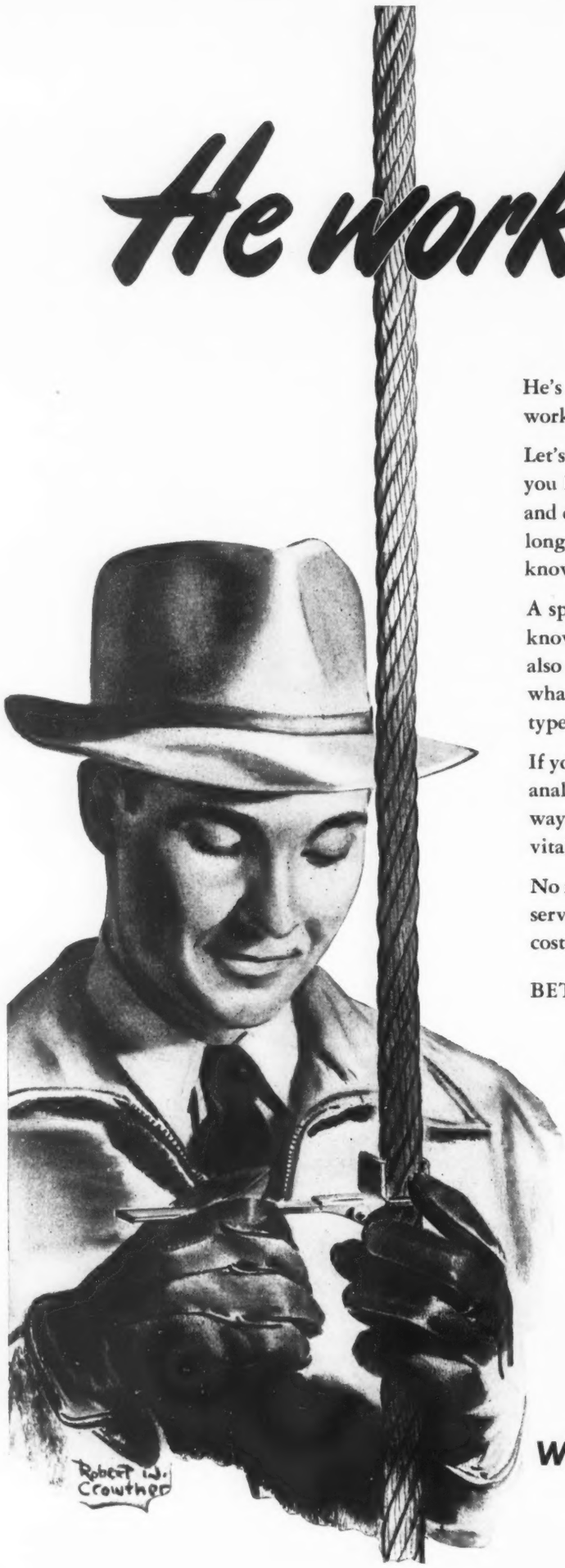
GUARANTEED PITTSBURGH ARMORED GEARS Reg. U. S. Pat. Off.

SEE THE PITTSBURGH GEAR DISTRIBUTOR NEAR YOU

PITTSBURGH GEAR COMPANY | 27th & Smallman Streets PITTSBURGH 22, PA.

GEARS AND PARTS FOR LOADERS, CUTTERS, LOCOMOTIVES

He works for you



He's a field engineer specializing in wire-rope problems. He works for Bethlehem, but he also works for you.

Let's say you operate machinery that uses wire rope. Maybe you haven't been getting maximum service from your lines and don't even realize it. Maybe they haven't been lasting as long as they should, and it's costing you money, whether you know it or not.

A spot like that is where the Bethlehem man can help. He knows wire rope, all the many sizes and types and grades. He also knows the kind of machines you use—how they work, what they do; why they need a certain lay of rope, a certain type of core.

If you'll ask him to study your needs, he'll give you a prompt analysis and recommend the proper ropes. He'll show you ways to get the most out of them. Both are points that have a vital bearing on rope life and efficiency.

No matter where you are, the Bethlehem man is glad to be of service to you. Call him in whenever you need him... doesn't cost you a penny.

BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.

On the Pacific Coast Bethlehem products are sold by
Bethlehem Pacific Coast Steel Corporation
Export Distributor: Bethlehem Steel Export Corporation

BETHLEHEM WIRE ROPE
BETHLEHEM STEEL

When you think WIRE ROPE ... think BETHLEHEM

NO WONDER
Coal Operators are Enthusiastic *about* NEW BULL DOG V-Belts

Fractional Horsepower (FHP) V-Belts are available in three standard sections, full range of lengths.

Bull Dog Industrial V-Belts are available in A, B, C, D and E sections, full range of lengths.

In these days of high operating costs, any product that boosts efficiency wins a warm welcome. So it's only natural that these rugged new Bull Dog V-Belts have won instant acceptance in an industry where steady, dependable, low-cost power is a basic need. In fact, leading industries everywhere have acclaimed Bull Dogs as the last word in V-Belt proficiency.

For more than 70 years, the name BWH has been known as a symbol of EXTRA service on mechanical rubber goods. And the new Bull Dog V-Belts proved in test after test that they assure exceptionally economical, trouble-free operation on all types of machinery.

Here's What Makes BWH Bull Dog V-Belts Outstanding:

1. ***Exclusive Bull Dog Cord Section with Higher Tensile Strength*** — able to carry the load and absorb shock.
2. ***Low Stretch*** — because Bull Dog Cords are processed in a new way. This means less slippage, fewer adjustments, longer belt life.
3. ***Cool Running*** — quality-controlled compounds developed in BWH laboratories don't crack or deteriorate under severe flexing.
4. ***Wear-Resistant Covers*** — made of bias-cut heavy fabric to protect the heart of the belt from dirt, grease, moisture.

SPECIFY BULL DOG V-BELTS FOR "MORE POWER TO YOU"

When you need V-Belts or other mechanical rubber goods, look to BWH for products of dependable ruggedness — BWH distributors for dependable service.

Another Quality Product of

BOSTON WOVEN HOSE & RUBBER COMPANY

Distributors in all principal cities

PLANT: CAMBRIDGE, MASS., U. S. A. • P. O. BOX 1071, BOSTON 3, MASS.

HERE IS WHAT MEN OF EXPERIENCE WILL TELL YOU ABOUT THE WHALEY "AUTOMAT" . . .

1.

OPERATING MAN

"I know from experience that the smoothest, most dependable loading action is the Whaley "Automat" Shovel Action. In coal or rock, you get equally effective service and consistent, maximum production."

2.

SUPERINTENDENT

"Any superintendent who keeps an eye on operating expenses knows that the "Automat" is a big power saver. This is because it uses only one motor of 25 H.P. with a power consumption of only 1/5 KWH per ton of material loaded."

3.

FOREMAN

"Limited headroom is no problem for the "Automat." Its parallel lift rear conveyor, always parallel to the top of the car, takes advantage of every inch of headroom and makes it possible to load maximum height cars to their full capacity."

4.

LOADER OPERATOR

"When we're loading in close places, it's good to know that the "Automat" is always safe. The Vertical Lift Shovel Action means all power is directed in a vertical plane making side-kicking impossible . . . no timber knocked out . . . no falls or injuries to men.

Myers Whaley

Remember, the "Automat" loads, in its stride, any lump of coal that will pass through your tipple, or any lump or rock your cars, aerial tram or larries can take.

"Mechanical Loaders Exclusively for Over 40 Years"

KNOXVILLE 6, TENNESSEE

From EAST to WEST

A P&H Model 1600 (6 cu. yds.) owned by Canadian Johns-Manville Ltd. located at Asbestos, Quebec, Canada.

P&H Model 1400 Electric Shovel owned by Johns-Manville Corporation Company, California.

Dozens of users of P&H Electric Shovels have found the P&H Magnetorque Drive an outstanding advantage. It transmits power for hoisting by electro-magnetic forces rather than by mechanical contact. It results in steadier, faster production—fewer interruptions. And it cuts maintenance costs to the bone. Many users state that they would select P&H Electric Shovels on the strength of this feature alone. Yet Magnetorque is only one of many sound reasons why experienced users re-order P&H Electric Shovels.

P&H ELECTRIC SHOVELS

4520 West National Avenue
Milwaukee 14, Wisconsin

HARNISCHFEGER CORPORATION

EXCAVATORS • ELECTRIC CRANES • ARC WELDERS • HOISTS • WELDING ELECTRODES • MOTORS

LEADING THE FIELD IN ELECTRIC SHOVEL DEVELOPMENT

Meet current sizing demands without extensive plant alterations install

AMERICAN Drop Cage CRUSHERS

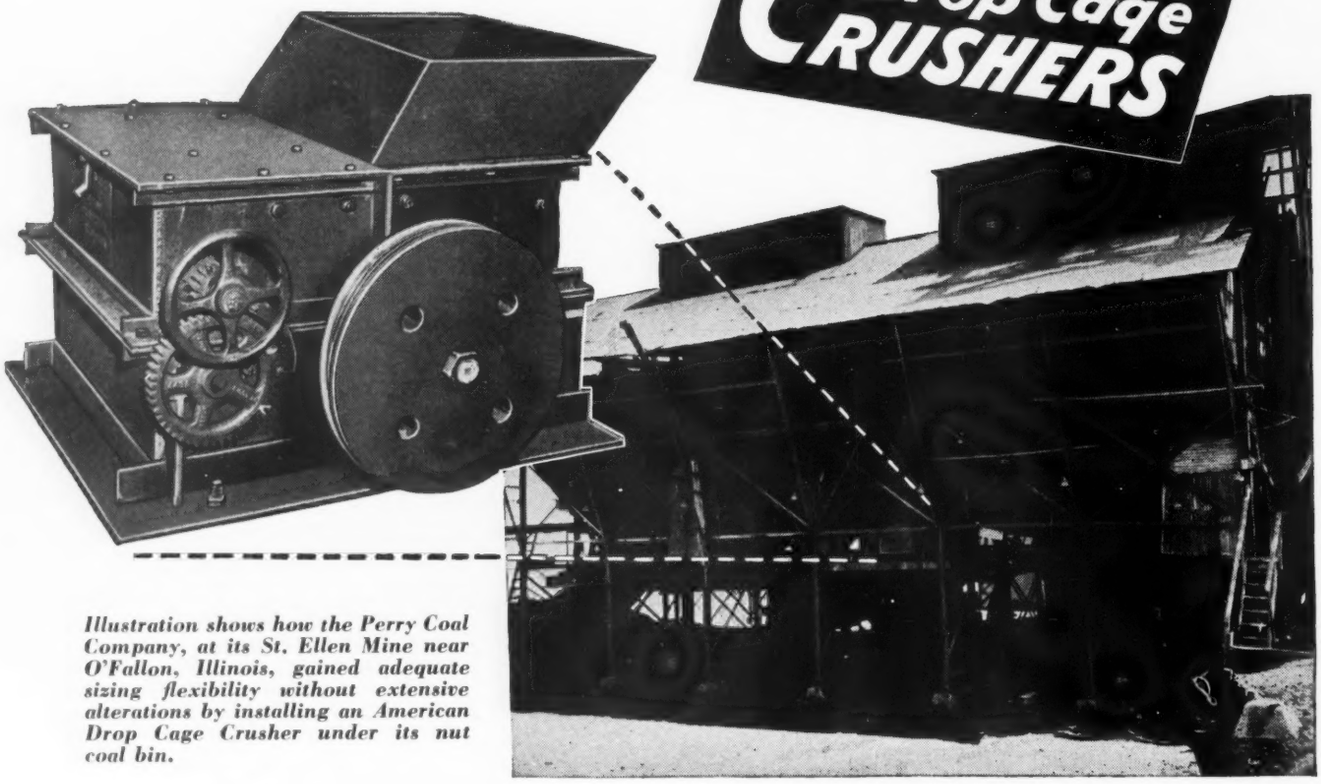


Illustration shows how the Perry Coal Company, at its St. Ellen Mine near O'Fallon, Illinois, gained adequate sizing flexibility without extensive alterations by installing an American Drop Cage Crusher under its nut coal bin.

To keep pace with today's changing conditions, mine preparation facilities must be able to adjust quickly and efficiently to rapidly fluctuating market needs. Operators throughout the country have found the answer to their need for *greater marketing flexibility* in installations of American Drop Cage Rolling Ring Crushers.

ECONOMICAL—AND PROFITABLE

New flexibility can be added to plants without extensive plant revision, and without disrupting production. Americans are designed to occupy the smallest possible area, with extremely low headroom requirements, assuring minimum installation costs. And—greater profits come with the greater marketing flexibility, because Americans give high tonnage production and minimum undesirable fines.

QUICKER, MORE EFFICIENT SERVICE

With American Drop Cage Crushers installed under storage bins, coal can be sized and delivered into waiting trucks and cars—in one operation—promptly, efficiently. Where no sizing is needed, coal can by-pass the crusher.

Americans are available in types to fit *your* operation—with capacities from 50 to 500 TPH. Why not find out how they can help make your coal marketing a more flexible, more profitable operation?

Send for Bulletin on Coal Crushing Data and Crusher Specifications

American PULVERIZER COMPANY

Originators and Manufacturers of Ring Crushers and Pulverizers

1119 MACKLIND AVE.
ST. LOUIS 10, MO.

How to stop bearing corrosion and save on replacements

The corrosion that wrecked this cadmium-silver bearing was caused by acids developed in ordinary lubricating oils. These acids eat into modern alloy bearings in a hurry and shorten bearing life. Frequent replacements, in turn, eat into profits.

To stop bearing corrosion and high operating costs, use RPM DELO Diesel Engine Lubricating Oil. It contains a special compound which makes it absolutely non-corrosive to all alloy bearing metals.

Bearings last longer and wear better with RPM DELO Oil.

CAUTION: There is no substitute for RPM DELO Oil
The formula for RPM DELO Diesel Engine Lubricating Oil has not been released to any other refiner for marketing under any other brand name or trademark.

Here are other special compounds that give diesels extra life, more efficiency:

1. DETERGENT gently removes carbon and varnish, keeps rings freer.
2. OXIDATION-INHIBITOR fights formation of gum and sludge, reduces oil-slot, filter and air port clogging.
3. METAL-ADHERING AGENT stops oil "creepage" from hot spots, reduced wear by 30% in lab tests.
4. FOAM-INHIBITOR prevents crankcase foaming that can cause lost suction in sump pump, result in oil-starved bearings.

DISTRIBUTED BY
GORDON LUBRICATING COMPANY
In Pennsylvania, Ohio, West Virginia, Kentucky
Box 313, McKees Rocks, Pa. Phone Federal 3200

DISTRIBUTED BY
TRANSCENTRAL OIL CORPORATION
In Indiana, Illinois, Missouri, Michigan
600 S. Michigan Ave., Chicago, Ill. HAR. 2677
Indianapolis, Ind. Market 1401

DIESEL ENGINE RPM DELO LUBRICATING OIL

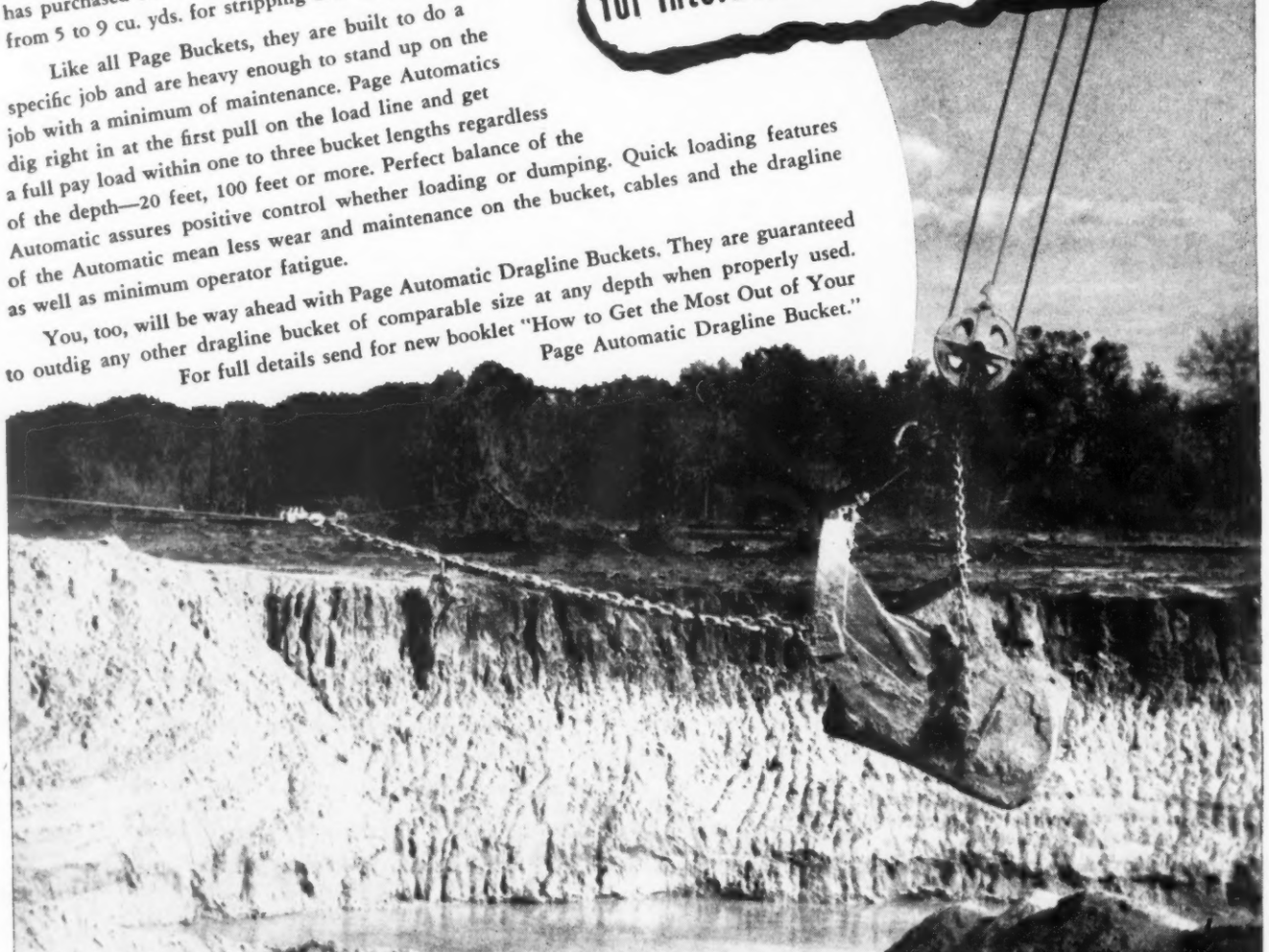
PRODUCT OF THE CALIFORNIA OIL COMPANY

12 PAGE BUCKETS
for International Minerals & Chemical Corp.

Whether your stripping or earthmoving jobs run into millions of yards per year like those of International Minerals & Chemical Corp. or a few thousand yards, you'll be way ahead in yards moved and savings when you use Page Automatic Dragline Buckets. International Minerals & Chemical Corp., one of the world's largest phosphate producers, has purchased twelve Page Automatics ranging in size from 5 to 9 cu. yds. for stripping and digging phosphate.

Like all Page Buckets, they are built to do a specific job and are heavy enough to stand up on the job with a minimum of maintenance. Page Automatics dig right in at the first pull on the load line and get a full pay load within one to three bucket lengths regardless of the depth—20 feet, 100 feet or more. Perfect balance of the Automatic assures positive control whether loading or dumping. Quick loading features of the Automatic mean less wear and maintenance on the bucket, cables and the dragline as well as minimum operator fatigue.

You, too, will be way ahead with Page Automatic Dragline Buckets. They are guaranteed to outdig any other dragline bucket of comparable size at any depth when properly used. For full details send for new booklet "How to Get the Most Out of Your Page Automatic Dragline Bucket."



PAGE ENGINEERING COMPANY
Clearing Post Office
Chicago 38, Illinois

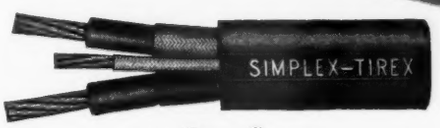
BETTER ROADS FOR A BETTER WORLD — 45th Annual Convention and Road Show — SOLDIER FIELD CHICAGO — JULY 16-24, 1948

PAGE *Automatic*

DRAGLINE BUCKETS and WALKING DRAGLINES

ANOTHER FIRST BY SIMPLEX!

NYLON gives Simplex - TIREX Twin Mining Cables greater Crushing and Impact Resistance



Type G

Simplex has brought out the first genuine improvement in mining machine cable construction in years. This improvement gives you, the user, much longer cable life under modern mining conditions. The high resistance of TIREX Twin Mining Machine Cables to crushing and impact has been more than doubled. It is done by the addition of a nylon braid on each conductor. The results are almost unbelievable.

If you have used this new TIREX Twin — and it has been out for some time now — you know how much longer TIREX Twin Cables will stand up under crushing and impact. If you haven't used it, by all means get some immediately and prove to yourself how much the Type G and Type W TIREX Twin Cables will save you in cable repair and replacement costs.

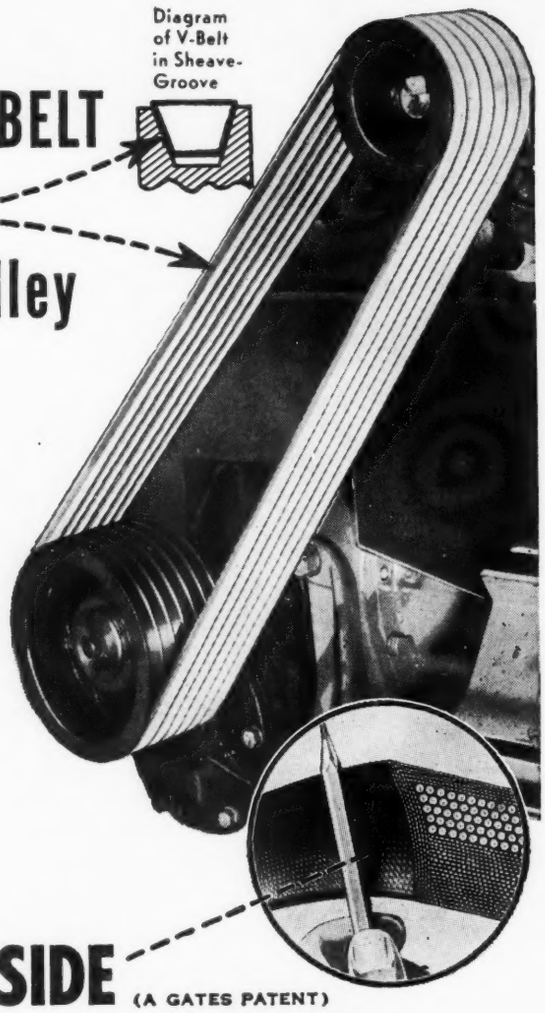
Always buy TIREX — the product of the leader in cable research and development.

Type W

Simplex WIRES & CABLES

SIMPLEX WIRE & CABLE CO., 79 SIDNEY ST., CAMBRIDGE 39, MASS.

The SIDE of a V-BELT is what GRIPS the pulley



Naturally, it GETS the WEAR!

Any one familiar with V-Belt drives knows that the sides of a V-Belt are what really get the wear.

It's the *sides* that grip the pulley. They *pick up* all the power from the driver pulley, *transmit* that power to the belt as a whole and then, once more, they *deliver* the power to the driven pulley. And, clearly, it's the *sides*—and *only* the sides—that take the wear against the sheave-groove wall.

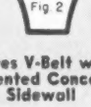
That is why you have always noticed that the *sidewall* of the *ordinary* V-Belt is the part that *wears out first*—and, naturally, if you prolong the life of the sidewall, you *lengthen* the *life* of the *belt!*

Now See How the CONCAVE SIDE (A GATES PATENT) SAVES Sidewall Wear and Lengthens Belt Life!

Straight Sided V-Belt

How Straight Sided V-Belt Bulges When Bending Around Its Pulley

You can actually feel the bulging of a straight-sided V-Belt by holding the sides between your finger and thumb and then bending the belt. Naturally, this bulging produces excessive wear along the middle of the sidewall as indicated by arrows.



Gates V-Belt with Patented Concave Sidewall

Showing How Concave Side of Gates V-Belt Straightens to Make Perfect Fit in Sheave Groove When Belt Is Bending Over Pulley

No Bulging against the sides of the sheave groove means that sidewall wear is evenly distributed over the full width of the sidewall—and that means much longer life for the belt!

The simple diagrams on the left show exactly why the ordinary, straight-sided V-Belt gets excessive wear along the *middle* of the sides. The diagrams show also why the Patented Concave Side greatly *lengthens the life* of the *sidewalls* of Gates Vulco Ropes. That is the simple reason why your Gates Vulco Ropes are giving you so much longer service than any straight-sided V-Belt can possibly give.

Saving SIDEWALL WEAR is more important NOW than ever before. ..

Now that Gates *SPECIALIZED* Research has resulted in Super Vulco Ropes capable of carrying much heavier loads—fully 40% higher horsepower ratings—the sidewall of the belt is called upon to do even more work in transmitting these heavier loads to the pulley. Naturally, with heavier loading on the sidewall, the life-prolonging Concave Side is more important now than ever before!

Gates

THE MARK OF SPECIALIZED RESEARCH

THE GATES RUBBER COMPANY ***Denver, U. S. A.***

"The World's Largest Makers of V-Belts"

487

GATES VULCO ROPE DRIVES

Engineering Offices and Jobber Stocks **IN ALL INDUSTRIAL CENTERS** of the U. S. and 71 Foreign Countries

Reclaiming dollars

THE terrific inroads that have been made on many of America's natural resources—by war and, in some instances, unwitting "squanderlust"—have brought industry, government and citizens to some sober fact-facing. Reclamation, as well as conservation, projects are being taken seriously. Gas, petroleum and timber wastes are being gone over. Lean ore and tailings are being reworked. Slag and culm piles are being combed for scrap and left-overs.

Fortunately, many reclamation projects have been made possible—and profitable—by advanced methods achieved through new types of equipment. For example:

On the project pictured here, powerful, fast-stepping "Caterpillar" Diesel Wheel Tractors are used to pull easy-loading, quick-dumping, big-capacity Athey wagons. From a mountainous culm pile they take coal-bearing spoil to a refuse-separating tipple. From there the worthwhile stock is rail-transported to a cleaning and sizing plant.

Location: Bear Valley, Pa. Contractor: D. A. Kessler Construction Co. Result: Thousands of tons of valuable anthracite salvaged, profitably marketed, and serving a useful purpose.

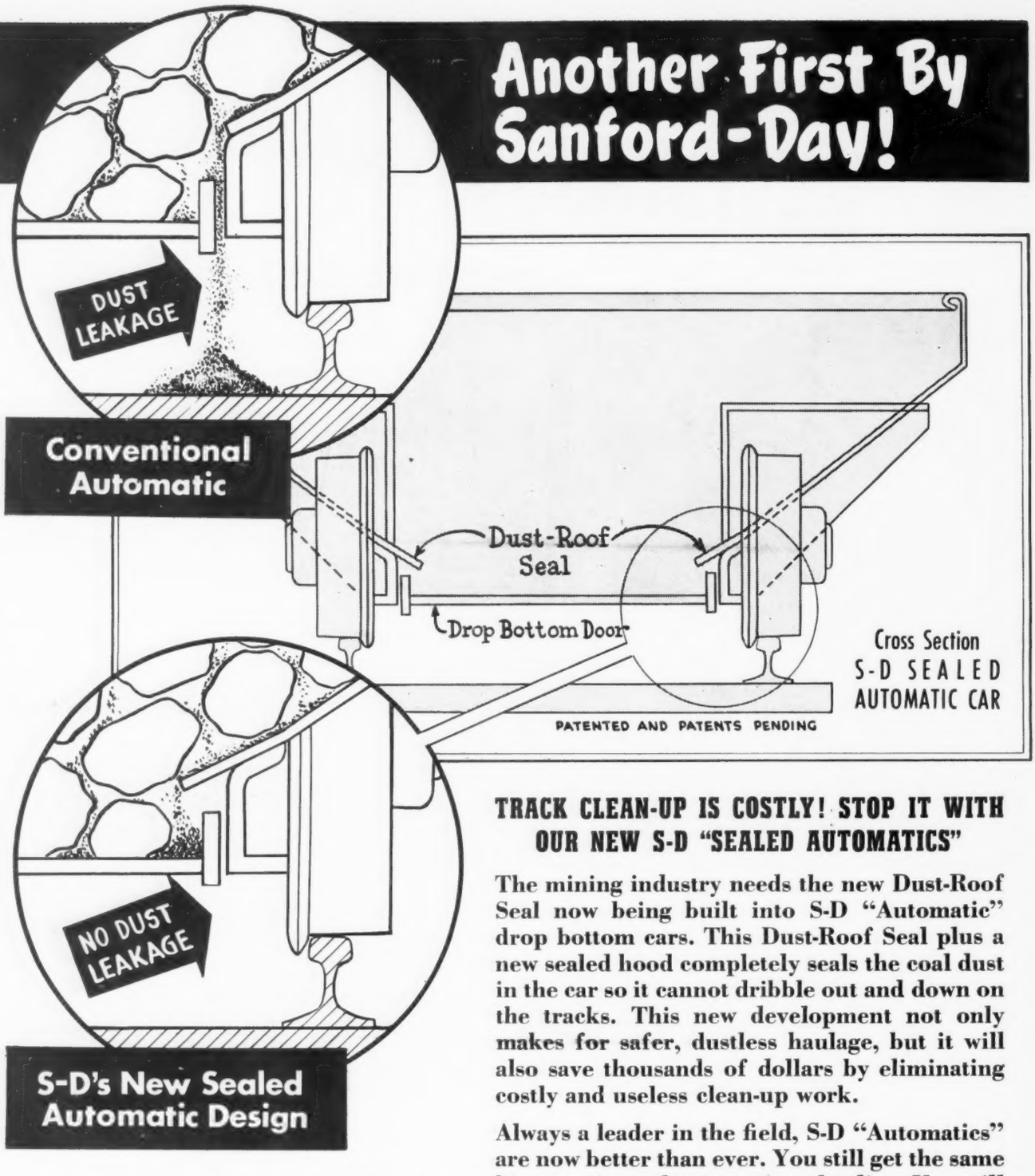
Whether for reclamation or strip-mining, look into today's line of "Caterpillar" Diesel Engines, Tractors (track-type and wheel), Scrapers, Bulldozers, Wagons and Motor Graders.

CATERPILLAR
REG. U. S. PAT. OFF.

DIESEL ENGINES • TRACTORS
MOTOR GRADERS
EARTHMOVING EQUIPMENT

CATERPILLAR TRACTOR CO., PEORIA, ILLINOIS

Another First By Sanford-Day!



Above is a diagram that shows how you can keep dust off your tracks with the S-D "Sealed Automatic." In the circle at top left, is shown the conventional drop bottom construction and how dust shakes down and out through the clearance space between the door and the car frame. The lower circle shows how the new Dust-Roof Seal carries sifting dust across the open space, providing a 100% effective dust seal.

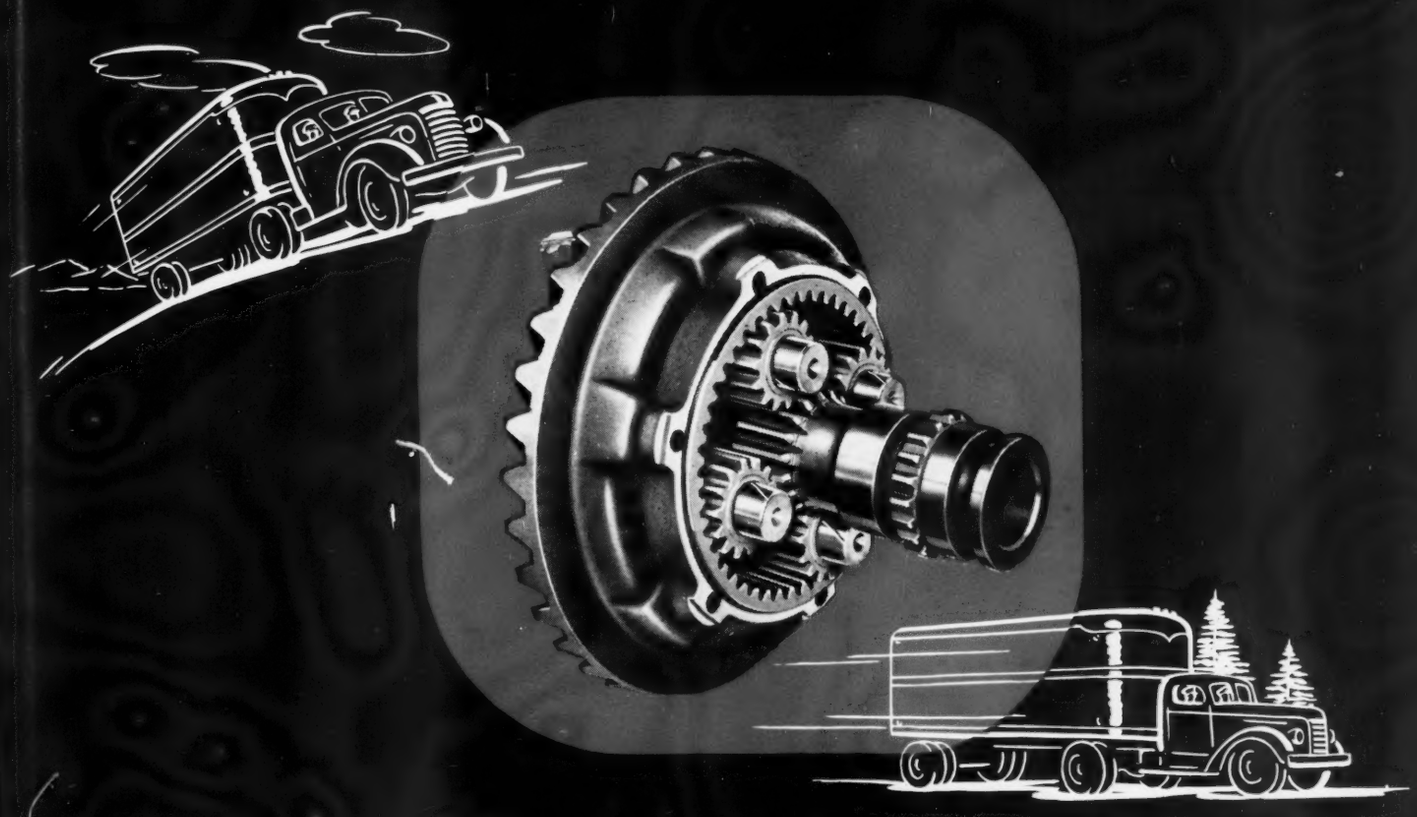
TRACK CLEAN-UP IS COSTLY! STOP IT WITH OUR NEW S-D "SEALED AUTOMATICS"

The mining industry needs the new Dust-Roof Seal now being built into S-D "Automatic" drop bottom cars. This Dust-Roof Seal plus a new sealed hood completely seals the coal dust in the car so it cannot dribble out and down on the tracks. This new development not only makes for safer, dustless haulage, but it will also save thousands of dollars by eliminating costly and useless clean-up work.

Always a leader in the field, S-D "Automatics" are now better than ever. You still get the same big capacity and automatic unloading. You still get our improved long-life construction and our foolproof "Jerkout" unlatching device that operates underneath the car. Now, with this revolutionary, money-saving SEALED construction, you get the best car the industry has ever known.

20 Car loads of "Automatics" from—

SANFORD-DAY IRON WORKS, Inc. Knoxville 9, Tenn.



Eaton Planetary Construction Makes Shifting Easy at all Speeds

The design and construction of Eaton 2-Speed Truck Axles permit the planetary parts to turn at slow speed. This allows smooth, easy, clash-free shifting from one range to another at *all truck speeds.* The result—proper shifting for most efficient and economical operation, minimum driver fatigue, and longer life for the entire truck. Outstanding performance records are proof of Eaton quality and design. See your truck dealer for complete information.

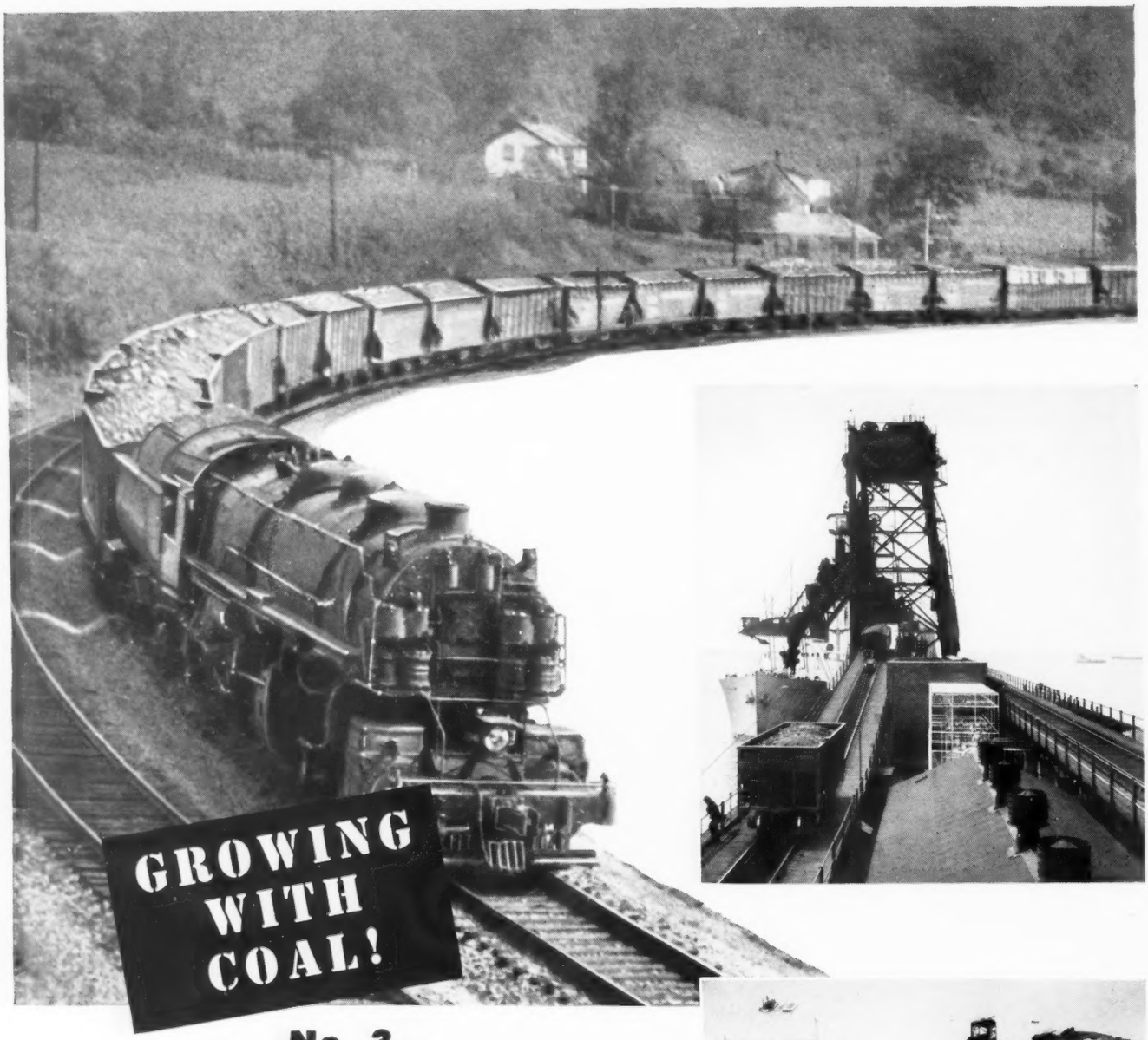
EATON 2-Speed Truck AXLES

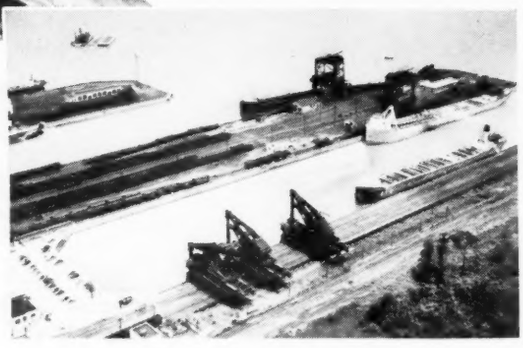
POWER WHEN YOU NEED IT—SPEED WHEN YOU WANT IT

EATON MANUFACTURING COMPANY

Axle Division

CLEVELAND, OHIO





No. 3...

COAL CARRYING CAPACITY

- C. & O.'s *daily coal loading* record was broken *six* times during 1947 and that record already has been exceeded *seven* times in 1948.
- The current daily record: 6,433 cars of coal loaded by Chesapeake and Ohio on June 15, 1948.
- The weekly, monthly and yearly coal loading records were also broken in 1947. 1,412,458 cars of coal were loaded in the 1947 record year.
- Dumping records at Chesapeake and Ohio's Toledo piers and Newport News piers were also established in 1947. Annual records exceeded in 1947: At Toledo 16,978,505 net tons; at Newport News 17,051,977 long tons.
- These records are presented as a yardstick to indicate that Chesapeake and Ohio's increasing coal carrying capacity is keeping pace with the growing coal industry.

The coal industry has made tremendous strides in recent years. Chesapeake and Ohio Railway is keeping pace. Cars, locomotives, track, yards, piers, and thousands of alert men and women add up to the coal carrying capacity of the C. & O. These coal handling records are cited, in the third of this series, to illustrate the great capacity of Chesapeake and Ohio to move coal from mines to markets.

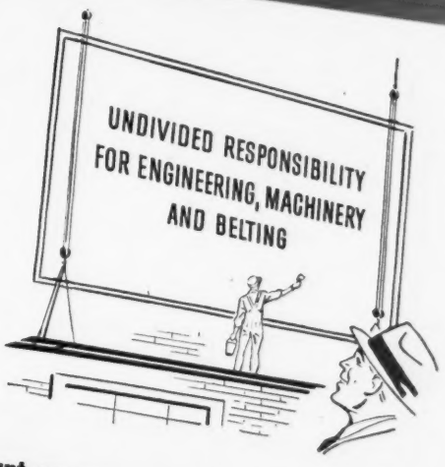
CHESAPEAKE & OHIO RAILWAY

Largest Originating Carrier of Bituminous Coal in the World

How to choose a mine conveyor

1 Select it like you do a piano

You don't buy a piano case from one place and the works of the piano from another. Instead, you buy a complete unit. Apply that same principle to your purchase of a mine conveyor. Get a *complete* unit! Buy both conveyor machinery and conveyor belting from the same source.



2 Count on one source for everything

Your mine conveyor's machinery and belting must be engineered to work *together*—just like the various parts in your piano. Rely on one manufacturer *for both conveyor elements*. Then you'll be sure of undivided responsibility for the whole job. And your mine conveyor will last longer!

3 Specify Hewitt-Robins Mine Conveyors

The Hewitt-Robins Mine Conveyor is the *only* one you can buy as a complete "package." You get machinery and belting engineered as a unit . . . and installed by Hewitt-Robins' service engineers. In fact, Hewitt-Robins is the *only* company that offers you this undivided responsibility.

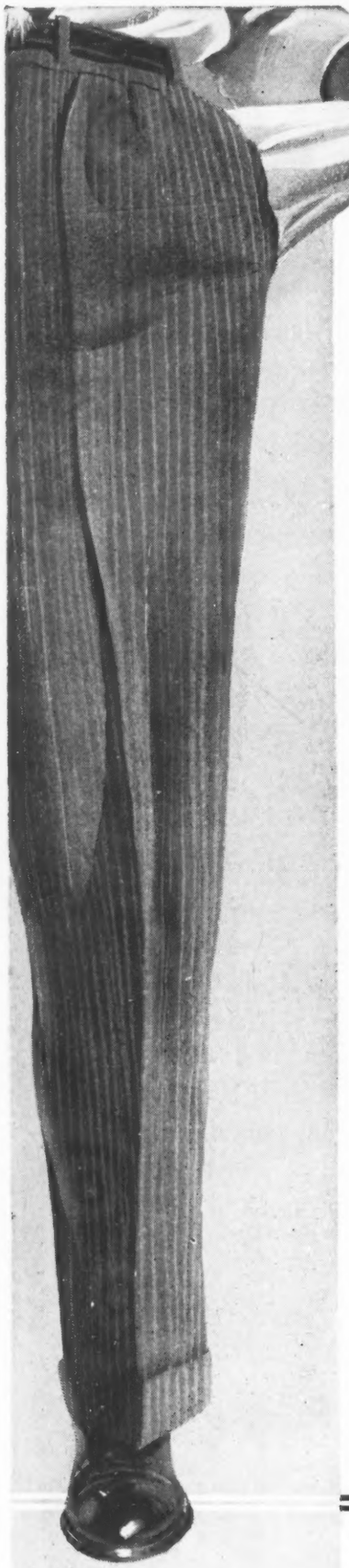
4 Remember this fact—

A Hewitt-Robins Mine Conveyor lasts longer . . . for it is the only one engineered, manufactured, and installed as a complete unit.

What's more, it's carried in stock for immediate delivery at Passaic, N. J. or Charleston, W. Va. Call on us for information about Hewitt-Robins Mine Conveyors. Hewitt Rubber Division, 240 Kensington Ave., Buffalo 5, N. Y. — or Robins Conveyors Division, Passaic, N.J.

Hewitt-Robins Mine Conveyors

made by HEWITT-ROBINS Incorporated



..a hole in your pocket?

Are you overlooking the holes in your "plant's pocket" . . . the little day-to-day losses that add up to big money?

A good way to stop those profit-eating losses is to be sure of equipment that eliminates the chance for human error . . . equipment such as Fairbanks-Morse Recording Scales.

Your scale may test accurately, but the person who reads it is just human . . . and it is human to err. That is why industry is installing more and more Printomatic Recorders . . . the scale that eliminates the human element. Just press a button and the weight is recorded on a ticket or tape. It's the fastest, most accurate and dependable way—"to weigh."

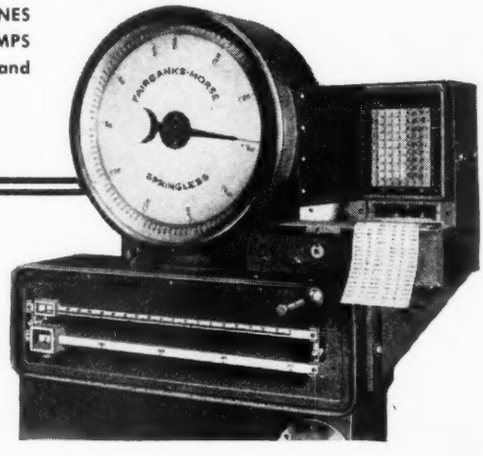
Why not have your local Fairbanks-Morse weighing expert show you how the Printomatic Recorder can help your operations. He will be glad to do so without any obligation. Fairbanks, Morse & Co., Chicago 5, Ill.

When it comes to scales

FAIRBANKS-MORSE

A name worth remembering

DIESEL LOCOMOTIVES • DIESEL ENGINES
STOKERS • SCALES • MOTORS • PUMPS
GENERATORS • RAILROAD MOTOR CARS and
STANDPIPES • FARM EQUIPMENT
MAGNETOS



a thousand and one job-proved wire ropes

There's a Macwhyte rope
that's the right rope
for your equipment.

Macwhyte Wire Rope

Use PREformed Whyte Strand for easy handling and longer service.

Macwhyte Distributors and Mill Depots—carry stocks for immediate delivery. Macwhyte representatives will recommend the correct rope for your equipment. Catalog on request.

MACWHYTE COMPANY
2931 Fourteenth Avenue • Kenosha, Wisconsin
Manufacturers of Internally Lubricated Wire Rope, Braided Wire Rope Slings, Aircraft Cables and Assemblies.
Distributors throughout U. S. A. and other countries.

Mill Depots:
New York
Pittsburgh
Chicago
Minneapolis
Fort Worth
Portland
Seattle
San Francisco
Los Angeles

RO. 941

CUT THE DOWNTIME! . . . SPEED UP THE JOB! . . .
INCREASE THE PROFIT! WITH . . .

Firestone TIRES

LESS DOWNTIME . . . MORE SPEED . . . MORE DIRT MOVED . . . THESE ARE THE KEYS TO PROFIT ON ANY JOB

Firestone pioneered in building big tires for earth-moving and other off-the-highway equipment, and through the years, Firestone has licked all the problems of off-the-highway operation.

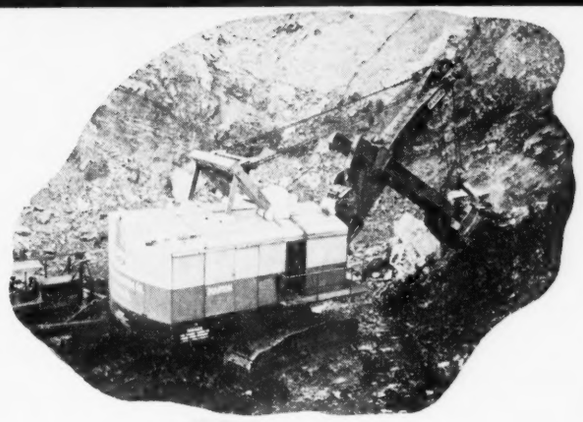
Backed by this experience, Firestone knows how to build tires that take the gaff day in and day out . . . tires that cut costly downtime . . . tires that speed up the job and help you make a profit.

Give Firestone tires a trial. Let them prove themselves on your equipment on the toughest job you have. They will save you money.

Copyright, 1948, The Firestone Tire & Rubber Co.

Firestone OFF-THE-HIGHWAY TIRES

Everywhere COAL IS BEING STRIPPED



MARIONS

are cutting operating costs!

The wide acclaim of Marion shovels and draglines in the Coal Stripping Industry is traceable to two important reasons:

One — Marion Engineers have the "know how" so essential to prescribe intelligently to the needs of the industry. This only comes from experience . . . an experience that has grown up with the industry itself.

Two — Marion machines are built in a wide range of sizes from 3/4 cu. yd. to 40 cu. yds. and in various types to cope with any overburden or coal removal problem.

Marion representatives are at your service in helping you select the most profitable Marion for your operation.

from 3/4 cu. yd. POWER SHOVEL COMPANY MARION SINCE 1884 to 40 cu. yds.

MARION

POWER SHOVEL COMPANY

MARION, OHIO, U. S. A.

Offices and Warehouses in all Principal Cities

P-G *Nonbreakable* STEEL GRID RESISTORS

for any job...

WHERE CONSTANT "TROUBLE-FREE" RESISTOR SERVICE IS ESSENTIAL!

P-G "Type T2" Steel Grid Resistors are designed for heavy duty applications in Mines, Steel Mills, Railroad Shops and any other usage where the electrical equipment may be subject to severe service. Built entirely of steel and mica, there is nothing to break. They are sturdy, light in weight and stand up well under occasional overload. Resistance values of P-G Resistors remain remarkably constant, regardless of temperature or age.

Give us your specifications...

A P-G engineer can help solve your Resistor problem.

P-G

The Nonbreakable Steel Grid Resistor

THE POST-GLOVER ELECTRIC COMPANY

• ESTABLISHED 1892 •

221 WEST THIRD STREET, CINCINNATI 2, OHIO

COST-SAVING...

PERFORMANCE

PRECISE engineering that keeps pace with continually changing industrial demands is a characteristic of the famous WILFLEY sand pump. Exclusive features of design and construction, continuously developed through pioneering and research, have kept this pump at the top of the list when cost-saving efficiency is the prime consideration. There is a size for every purpose. Heavy pumping parts of rubber, alloy iron, alloy steel—whatever material works best on your job. Individual engineering on every application. Buy WILFLEY when you want dependable performance that holds production costs down. Write or wire for complete details.

1 *True High Efficiency*

2 *Individual engineering on every application*

3 *Continuous, trouble-free performance twenty-four hour-a-day production*

WILFLEY
centrifugal PUMPS

A. R. WILFLEY & SONS, Inc., Denver, Colorado, U.S.A., New York Office: 1775 Broadway, New York City

How to S-T-R-E-T-C-H your Steel Supply

IT's really simple. Just use "the steels that do more"—U·S·S COR-TEN or U·S·S MAN-TEN—in place of carbon steel. And your steel supply will go *one-third* farther.

By taking advantage of the higher physical properties of these high-strength steels, you can use thinner sections to produce units that weigh one-fourth less . . . that are substantially stronger and more durable . . . that require one-fourth less steel per unit. As a result, in many cases, you can produce as much as one-third more units from every ton of steel used.

Since both U·S·S COR-TEN and U·S·S MAN-TEN, like plain carbon steel, can be readily fabricated . . . since one-fourth less steel is required per unit, with consequent reduction in shipping costs . . . since fixed charges can be spread over one-third more units . . . your finished product can be built at little or no increase in cost.

CALL US FOR . . .
"THE STEELS THAT DO MORE"

U·S·S COR-TEN and U·S·S MAN-TEN steels are stocked by our eleven warehouses located in principal cities across the country. Our other High Strength Steels, U·S·S ABRASION RESISTING and U·S·S MANGANESE-NICKEL-COPPER are also stocked to satisfy your various requirements.

SYMBOL OF SERVICE *for Steel Users*

UNITED STATES STEEL SUPPLY COMPANY — USS STEELS — SERVICE

UNITED STATES STEEL SUPPLY COMPANY

CHICAGO (90)	1319 Wabansia Ave., P. O. Box MM	BRUnswick 2000
BALTIMORE (3)	Buh & Wicomico Sts., P. O. Box 2036	EDmondson 4900
BOSTON	176 Lincoln St. (Allston 34), P. O. Box 42	STadium 2-9400
CLEVELAND (14)	1394 East 39th St.	HEnderson 5750
LOS ANGELES (54)	2087 East Slauson Avenue P. O. Box 2826—Terminal Annex	LAfayette 0102
MILWAUKEE (1)	4027 West Scott St., P. O. Box 2045	Mitchell 5-7500
NEWARK (1), N. J.	Foot of Bessemer St., P. O. Box 479	Bigelow 3-5920 REctor 2-6560—BErgen 3-1614
PITTSBURGH (12)	1281 Reedsdale St., N. S.	ALlegheny 4200
ST. LOUIS (3)	311 S. Sarah St., P. O. Box 27	LUcas 0440
SAN FRANCISCO (1)	1940 Harrison St., P. O. Box 368	MArket 1-4988 ENterprise 1-0017
TWIN CITY	2545 University Ave., St. Paul (4), Minn.	NEstor 7311

UNITED STATES STEEL

Announcing

The WILMOT SYSTEM for PREPARING ANTHRACITE FINES

Now--"Recover Everything But the ~~Squeal~~ refuse"

GET THE PREMIUM PRICE FOR YOUR FINES

An established, urgent demand for anthracite fines is now a fact, fully to be faced. The industry is challenged to meet this demand and, incidentally, is invited to profit from the higher prices offered for premium No. 4, No. 5 and No. 6 coal. The "Wilmot System for Preparing Anthracite Fines", shown on the above flow chart, is proving a simple and thoroughly practical method for producing a line of carefully sized and pure fines. The system is completely flexible. For instance, if you are already preparing No. 4, the addition of one or two Hydrotator-Classifiers will produce No. 5, or No. 5 and 6, as desired.

EQUIPMENT FOR WILMOT SYSTEM

Use Wilmot Hydrotators for Egg to No. 4 sizes. Use Wilmot Hydrotator-Classifiers for No. 5 and No. 6 anthracite fines.

We invite you to use our engineering and laboratory services in the study of how to adapt your plant to the recovery of more fines.

WILMOT ENGINEERING CO.

HAZLETON, PA.
Plant:
WHITE HAVEN, PA.

Wilmot Coal Preparation Equipment: Hydrotators • Hydrotator-Classifiers • Hydro-Separators • Simplex Jigs Crushing Rolls • Sizing Shakers • Bucket Elevators • Conveyors • Car Hauls • Keystone Rivetless Chain, etc.

WILMOT BUILDS BETTER BREAKERS

A Good Beginning For Any Product

Here's why "Norma-Hoffmann or equal" is found on thousands of blueprints embracing all types of equipment. It results from designers' preference for bearings that have earned a reputation over the past 30 years for *precision* and *quality*.

And with good reason! These bearings provide ruggedness, dependability, long life and low upkeep. They assure minimum cost per bearing-year of service. Their accuracy and built-in high antifriction characteristics improve product performance. While the wide range of choice . . . 108 distinct series, over 3,000 sizes . . . makes selection easy.

NORMA-HOFFMANN
Precision
BEARINGS
BALL • ROLLER • THRUST

NORMA-HOFFMANN BEARINGS CORPORATION, STAMFORD, CONNECTICUT • FIELD OFFICES: New York, Chicago, Cleveland, Detroit, Pittsburgh, Cincinnati, Los Angeles, San Francisco, Dallas, Seattle, Phoenix

AMERICAN
CYANAMID COMPANY

EXPLOSIVES

We CONSTANTLY Experiment with Explosives

So that you will NEVER have to...

Shown above is an important piece of modern equipment, involving specialized skills and techniques, that is used in one of the AMERICAN laboratories for the preparation of experimental explosive compositions. It is part of a continuous research and development program that makes it unnecessary for you ever to take a chance in selecting explosives for your particular requirements.

AMERICAN quality-controlled explosives and supplies are available in a complete range of strengths, velocities and densities. Whatever your needs, the AMERICAN line is your assurance of maximum dependability. Always specify AMERICAN.

Capable Field Engineers Are Available At Your Call

★ HIGH EXPLOSIVES ★ PERMISSIBLES ★ BLASTING POWDER ★ BLASTING ACCESSORIES

AMERICAN CYANAMID COMPANY

EXPLOSIVES DEPARTMENT

30 ROCKEFELLER PLAZA • NEW YORK 20, N. Y.

SALES OFFICES: PITTSBURGH, PA. • BLUEFIELD, W. VA. • SCRANTON, PA. • CHICAGO, ILL. • POTTSVILLE, PA. • MAYNARD, MASS.

Rockbestos A.V.C. is permanently insulated with impregnated *felted asbestos*—a material that is older than coal.

The processing of this ageless mineral on electrical conductors to form an enduring insulation was developed by Rockbestos. The original Rockbestos A.V.C. Mining Cable has been *proven* the longer-lasting internal wiring cable for every kind of mechanized equipment. More mines have successfully used Rockbestos A.V.C. — for more years — than any other cable of its type ever made.

When ordering new locomotives, cutters, drilling machines, loaders or other mining equipment, or when replacing old cable, specify "Rockbestos A.V.C."

Rockbestos A.V.C. gives new performance and dependability to old equipment, keeps new equipment newer longer. It's your best cable buy. Send for samples and Bulletin 30-C.

Rockbestos Products Corp., Dept. M-15, New Haven 4, Conn.

ROCKBESTOS

THE CABLE WITH PERMANENT INSULATION

ORDER FROM THESE JOBBERS—SPECIFY "ROCKBESTOS A.V.C."

BECKLEY, W. VA.: National Mine Service Co.
BIRMINGHAM, ALA.: Moore-Handley Hdwe. Co.
BLUEFIELD, W. VA.: Superior-Sterling Co.
CHARLESTON, W.VA.: Charleston Elec. Supply Co.
CLEVELAND, OHIO: Upson-Walton Co.
EVANSVILLE, IND.: Evansville Elec. & Mfg. Co.
FAIRMONT, W. VA.: Fairmont Supply Co.
HUNTINGTON, W. VA.: Banks-Miller Supply Co.
LOTHAIR, KY.: Mine Service Co.
MIDDLESBORO, KY.: Rogan & Rogan Co.
PITTSBURGH, PA.: Upson-Walton Co.
Westinghouse Elec. Supply Co.
SCRANTON, PA.: Penn. Elec. Engineering Co.
WHEELING, W. VA.: Westinghouse Elec. Supply Co.
WILLIAMSON, W.VA.: Williamson Supply Co.

How do you measure Economy?

. . . low fuel costs?

. . . minimum maintenance?

. . . long engine life?

Cummins Diesels have all of these . . .

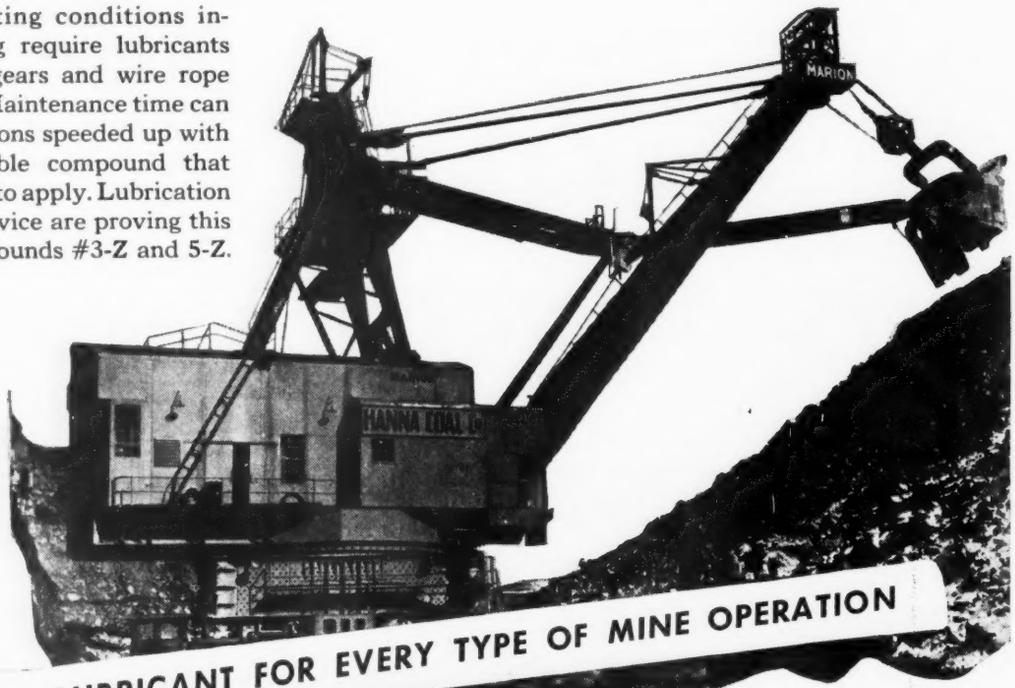
For example, Rothey Brothers, Inc., Elizabeth, Pa., produces 1500 to 2100 tons of bituminous coal daily at its Mayview stripping operation with the aid of economical Cummins Diesels. On this job, it is necessary to scalp and store four to five feet of topsoil, and remove 15 to 20 feet of additional overburden. This firm operates three Cummins Diesels—one Model LI-600 powering a three cubic-yard Marion dragline; one Model HIP-600 powering a Lima shovel; and one Model HBIS-600 powering an Oliver Cletrac.

CUMMINS ENGINE COMPANY, INC. • COLUMBUS, INDIANA

STRIP MINING

Problem: **To find an Effective Wire Rope and Gear Compound**

Solution: The operating conditions involved in strip mining require lubricants able to protect open gears and wire rope against rust and dust. Maintenance time can be reduced and operations speeded up with a tough gear and cable compound that doesn't require heating to apply. Lubrication Engineers of Cities Service are proving this daily with Cisco Compounds #3-Z and 5-Z.



EVERY TYPE OF LUBRICANT FOR EVERY TYPE OF MINE OPERATION

UNDERGROUND MINING

Problem: **To cut Maintenance Costs of Mechanical Loaders**

Solution: The gear lubricant for use in underground loaders must meet exacting requirements. The adverse operating conditions, dust and long working hours demand lubricants of unusual stability aside from other characteristics. Cities Service products used here have reduced maintenance problems for a long list of mine operations.

FREE

A new booklet: "Coal Mining Machinery Lubrication," is yours at no obligation. Write 60 Wall Tower, Room 177, N.Y. 5, N.Y.

CITIES SERVICE

QUALITY PETROLEUM PRODUCTS

Announcing the New Airco 700 Welding Torch

The Airco 700 is easily converted to handle general shop cutting work by the addition of a cutting attachment.

. . . DESIGNED TO HANDLE 90% OF YOUR WELDING AND BRAZING JOBS

Before designing the new Airco 700 Torch, we asked shop operators and welders what features they wanted in a welding torch. The new "700" incorporates their recommendations and those produced by Airco research engineers. Salient features are:

Wide Operating Range . . . The Airco 700 Torch is available with a wide selection of tips for use on almost any welding job from thin sheet metal up to two inch plate. Equipped with a multi-flame tip, it is unbeatable for silver and aluminum brazing.

Better Flame Control . . . The Airco 700 Torch is available with tip assemblies which range from Nos. 00 thru 10. Each welding tip is assembled with a mixer drilled for that particular size of tip. This means finer flame control . . . there is no sputtering —better welds result.

Low Maintenance Costs . . . The Airco 700 Torch has a head of durable, long-wearing monel metal. This means fewer replacements and also lower maintenance costs because rarely is reseating required.

Perfect Balance . . . The Airco 700 Torch (with a No. 5 tip) weighs only 19½ ounces and is 16½ inches in length. Equipped with 3/16" I.D. hose, the "700" eliminates heavy hose drag, and reduces operator fatigue.

For heavier jobs, Airco also has available a Series 800 Torch which is comparable to the "700" in both appearance and operating characteristics.

If you would like to have either the "700" or "800" demonstrated in your shop . . . or if you desire more information about these torches, address Dept. CA - 8414, Air Reduction, 60 East 42nd Street, New York 17, N. Y. In Texas: Magnolia Airco Gas Products Company, Houston 1, Texas. On West Coast: Air Reduction Pacific Company, San Francisco 4, Calif.

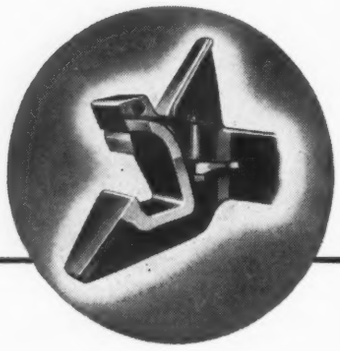
AIRCO

AIR REDUCTION

Offices in all principal cities

Headquarters for Oxygen, Acetylene and Other Gases . . . Carbide . . . Gas Welding and Cutting Machines, Apparatus and Supplies . . . Arc Welders, Electrodes and Accessories

Speed Operation



1. Safer operation...coupling and uncoupling without going between cars
2. Faster handling of large cars
3. Faster shunting and gathering
4. Less spillage
5. No uncoupling on rotary dumps

NATIONAL Products FOR TRANSPORTATION AND INDUSTRY

Est. 1868

AT THE WORKING FACE

Willison Automatic Couplers on your mine cars speed shunting and train assembly with safety. Coupling is automatic, reducing injuries, because workers don't get between the cars.

Your operating statements will reflect more trips per day and lower production costs when you specify Willison Couplers on your new or rebuilt cars. Get that increased tonnage at less cost.

NATIONAL MALLEABLE AND STEEL CASTINGS COMPANY

CLEVELAND, OHIO

WILLISON AUTOMATIC COUPLERS • NACO STEEL WHEELS • NACO STEEL LINKS AND SWIVEL HITCHINGS

Helps a loader throw its weight around

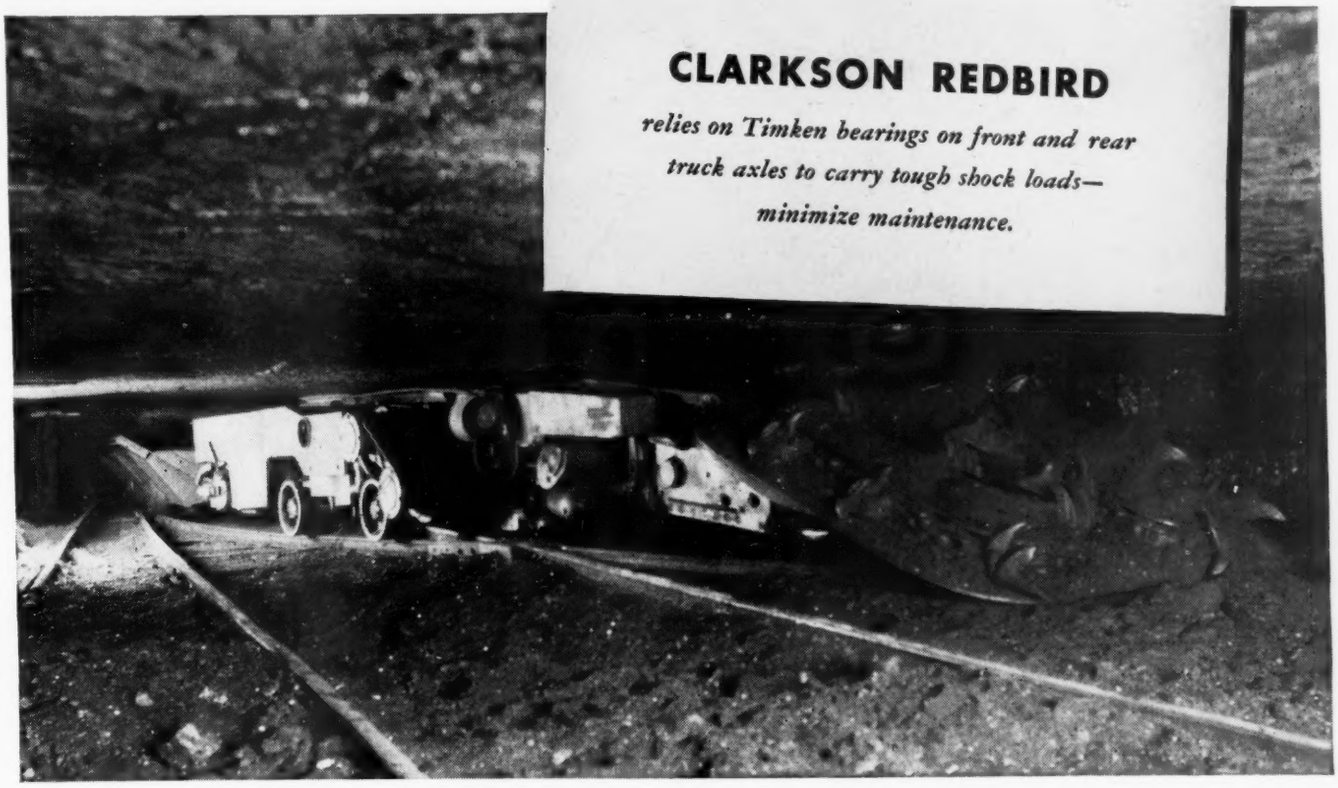
THE constant pushing, swinging, scooping action of a mechanical coal loader is carried on the bearings of the front and rear trucks. That's why, in the Clarkson Redbird, Timken bearings are used.

Timken bearings carry jolts and jars from any direction because of their tapered construction. And the line contact between rolls and races enables them to stand up under the heaviest loads. Further, Timken bearings are made of the finest bearing material ever developed—Timken alloy steel. With hardened surfaces, and tough inner cores, Timken rolls and races resist wear and withstand severe shock. So with Timken bearings on the axles, mechanical loaders keep on the job with minimum maintenance.

Timken bearings save lubrication time, too. They permit closures which effectively retain lubricants for long periods of time.

No other bearing can give you *all* the many advantages you get with Timken bearings. They're backed by 49 years of bearing research and development. That's why it's so important to look for the trade-mark "Timken" on every bearing you use. The Timken Roller Bearing Company, Canton 6, Ohio. Cable address: "TIMROSCO".

TIMKEN BEARING EQUIPPED — *This symbol on a product means its bearings are the best.*



CLARKSON REDBIRD

relies on Timken bearings on front and rear truck axles to carry tough shock loads—minimize maintenance.

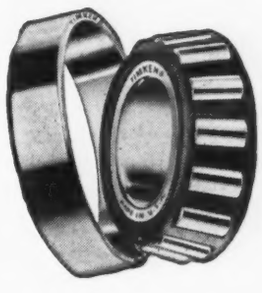
TIMKEN BEARING CAPACITY RATINGS INCREASED 25%. Since Timken bearings were re-rated some 15 years ago there has been such a further and constant improvement in quality that we are now able to announce a 25% increase in radial and thrust load carrying capacity. This may make possible the use of smaller bearings with savings in bearing cost, material cost and weight. Engineers will be able to utilize the advantages of Timken bearings in more applications than in the past.

A new Timken Engineering Journal, now in preparation, will give you complete capacity rating tabulations. For further assistance, write us today.

TIMKEN

TRADE MARK REG. U. S. PAT. OFF.

TAPERED ROLLER BEARINGS



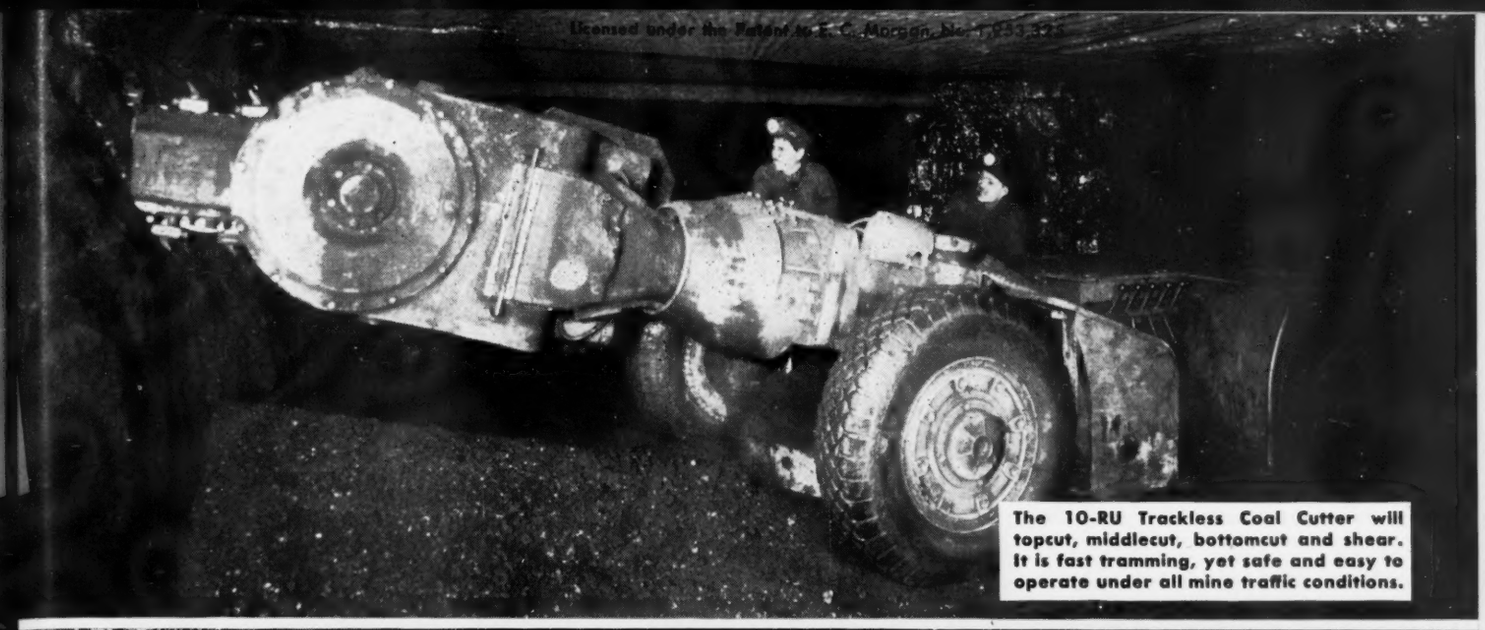
NOT JUST A BALL ○ NOT JUST A ROLLER ▭ THE TIMKEN TAPERED ROLLER ▭ BEARING TAKES RADIAL ◫ AND THRUST ◫ LOADS OR ANY COMBINATION ◫

JOY
COAL CUTTERS

SHORT WALL OR UNIVERSAL TYPES
ARE SETTING NEW RECORDS
UNDER ALL SEAM CONDITIONS

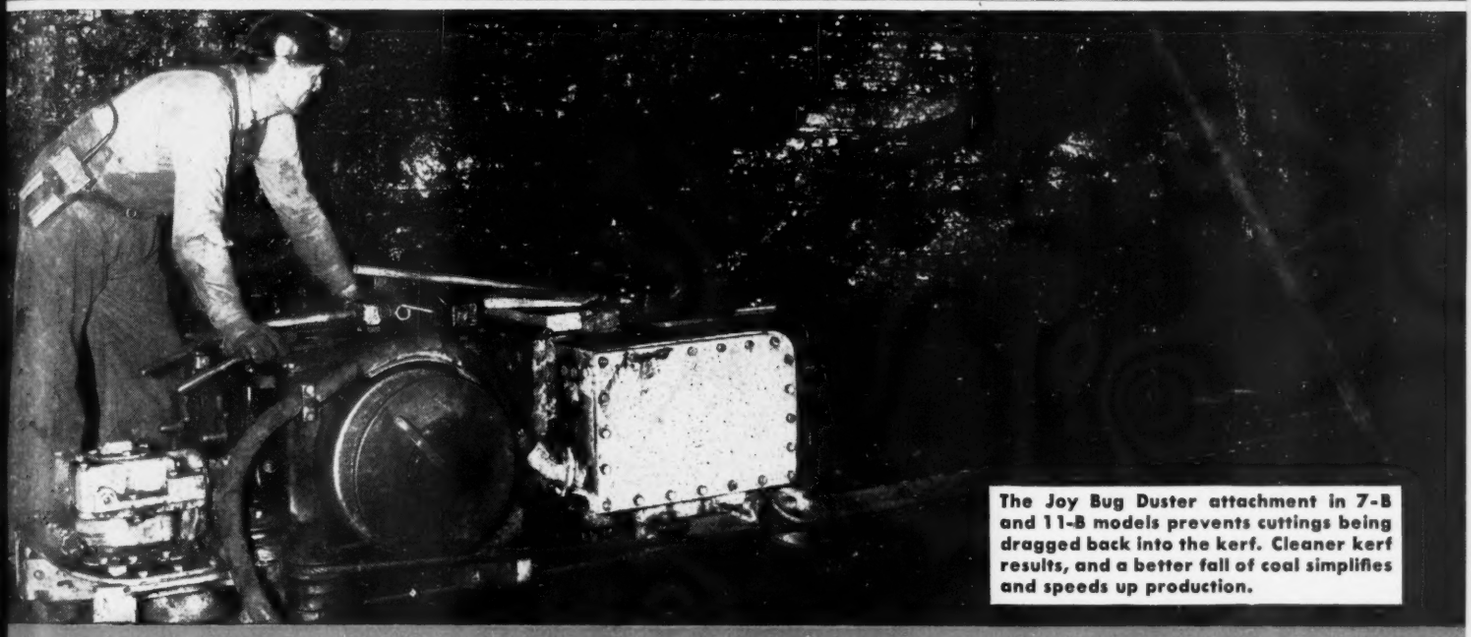
Consult a Joy Engineer for—

"The World's Most Complete Line of Modern Mining Equipment"



Licensed under the Patent to E. C. Morgan, No. 1,933,325

The 10-RU Trackless Coal Cutter will topcut, middlecut, bottomcut and shear. It is fast tramming, yet safe and easy to operate under all mine traffic conditions.



The Joy Bug Duster attachment in 7-B and 11-B models prevents cuttings being dragged back into the kerf. Cleaner kerf results, and a better fall of coal simplifies and speeds up production.

JOY
SULMET BITS
CARBIDE-TIPPED

Cut up to 30% faster

Retain cutting edge longer

Cut more with less changes

W&D

SULLIVAN DIVISION

JOY MANUFACTURING CO.

GENERAL OFFICES: HENRY W. OLIVER BLDG., PITTSBURGH 22, PA.

What one method of detonating has these five advantages over any other method?

The PRIMACORD method . . .

1. Primacord extends the full depth of a hole, contacting every cartridge in the load. Thus, *it initiates the entire charge at maximum power.*
2. Primacord can be hooked up for multiple-hole shots so that *it fires front lines a split-second before succeeding ones.* This permits you to plan for ideal relief of burden and secure better fragmentation.
3. Since Primacord is a non-conductor, *it is insensitive to any stray electric currents,* and is the only logical detonator to use around high-voltage equipment or wherever lightning storms are common.
4. Primacord reduces loading time because *it hooks up quickly and easily* with square knots for the main lines and half hitches for down-hole connections.
5. Wound on easy-to-handle spools, *Primacord comes in grades to meet every blasting condition.*

Blasters who use Primacord consistently agree there is no substitute. For more information ask your explosives supplier . . . or write us direct. The Ensign-Bickford Co., Simsbury, Connecticut. P-6

PRIMACORD-BICKFORD Detonating • Fuse •

Also Ensign-Bickford Safety Fuse Since 1836

Devoted to the Operating, Technical and Business Problems of the Coal-Mining Industry

Coal Age

AUGUST, 1948

IVAN A. GIVEN, EDITOR

Still Good

PERHAPS BECAUSE COAL was dogged so closely by assorted troubles for so many years—and still has some difficulties on its hands—quite a few operators are inclined to wonder if its present improved position can even be maintained let alone expanded. These operators look at additions to capacity already made or planned for the future and ask if the demand will be there to match them or if they will merely add speed to a downward slide in the days to come.

Anything, of course, can happen. But the indications still are that the factors favoring coal definitely outweigh those on the opposite side. If there was nothing else, the growth in population should mean that coal can reasonably expect more business in the future, aside from prospects in the synthetic-liquid-fuel field and elsewhere. As always, however, price, quality and service, including continuity of supply, will remain vital factors in cashing in to the utmost against competition.

Because wage increases and other concessions have kept cost increases running well ahead of increases in efficiency for quite a few years, the last hike—and the production interruptions that preceded and accompanied it—have deepened the fear of many coal men that decreased competitive power will unduly limit coal's gains and perhaps, even, bring about a recession with all its attendant difficulties. That fear has some basis in fact. Now, if ever, is the time to halt cost boosting until the industry has a chance to raise its productivity and regain its former competitive position. Now also is the time, if ever, for all parties to work for more harmonious relations and the reaching of agreements without work stoppages, name-calling and the general contentiousness that increase public impatience and accelerate attempts to change to other fuels. Some suggestions in that direction, based on a study of recent events and checks with a number of key principals and operators, are the subject of the feature beginning on the next page of this issue.

With some degree of stability and harmony in labor and contractual relations, the second part of the job—keeping cost down and raising the level of quality and service—is not too difficult. In fact, coal has a much better chance in that direction than its competition, even natural gas, the most troublesome at present. There is still room for a major increase in efficiency and quality through mechanical mining and preparation, with the continuous miner and better stripping units on the verge of making possible another major step forward on top of what can be accomplished by wider and better use of existing facilities.

In spite of continuing difficulties and problems yet to be solved, coal's outlook is still good—in fact, better than good. The difficulties can be eliminated and the problems solved by intensified effort and then the industry really will be set to capitalize on its future opportunities.

Another Road

ALTHOUGH COAL is not at present faring too well in the railroad field for a variety of reasons, some of which, such as quality, are its own responsibility, the indications are multiplying that it will come back stronger than ever. If nothing else works, coal can look forward to supplying the oil that goes into the diesel tanks. The gas turbine, however, will definitely go into active competition with the diesel in the near future. Firing it directly with coal is the most attractive possibility, with producer gas made from coal on the tender as the second. Still another alternative that has real possibilities is the production of a burning tar for turbines by the low-temperature distillation of coal. Whichever way the cat jumps, coal has the inside track.

Major 1948 Issues and How the Parties Stood

MR. LEWIS—"Mr. Van Horn is against pensions and against any operation of the welfare fund that could be blocked."

MR. VAN HORN—"I have done everything in my power to have the fund become operative."

Proposing Pension Plans

Mr. Lewis—"From early in 1947, when the original proposal for a pension plan was placed before the Trustees, until June, 1948, Mr. Van Horn offered no plan or counter-proposal regarding pensions."

Mr. Van Horn—"My position is that [first] we should determine who are eligible for these benefits. Second is that we should determine what portion of the fund should be expended for each of the purposes set up for their use. And third, we should have the detailed written agreement as to how they were to be expended."

Actuarial Soundness of Pension Plans

Mr. Lewis—"While we waited for that report [the Towers, Perrin, Forster & Crosby actuarial study] from July to November, when it came it was merely a lot of conjectures that I could have dictated in 30 minutes to a stenographer . . . The Latimer study [in May] was the only report that dealt with the problem . . . in a businesslike and practical manner . . . Both private industry and the government have found out that only by experience in the operation of a fund can its actual costs be determined . . . The Trustees of necessity could not pay out more for pensions than the income of the fund permitted."

Mr. Van Horn—"It was not actuarially sound."

U.M.W. Members Not Employed by Signatories

Mr. Lewis—"I do not [have any idea how many there are] and there is no one in this country who does."

Mr. Van Horn—"There was no way we could get at that; that would have to be taken from the records of the U.M.W. and I was unable to get from even the Trustees a list of all the signatories to the 1947 agreement . . . We did not know the number of men but we could estimate the number of men that were not covered by this contract . . . 40,000 men who would be employed in the producing of coal who are not signatory to this agreement."

Naming a Neutral Trustee

Mr. Lewis—"No comment."

Mr. Van Horn—"I presented several names to Mr. Lewis for his consideration and he never—those were never acted upon, not any of them . . . Mr. Lewis went away about that time and did not get back until sometime in March and sometime about the first of March I gave him another—I submitted another list of names to him in a letter which contained all of the names that I had in the first list, and several additional ones."

A Wage Increase

The Operators—"There can be no justification of a requirement for further wage increases, thus contributing to the inflationary spiral that everybody fears at this time."

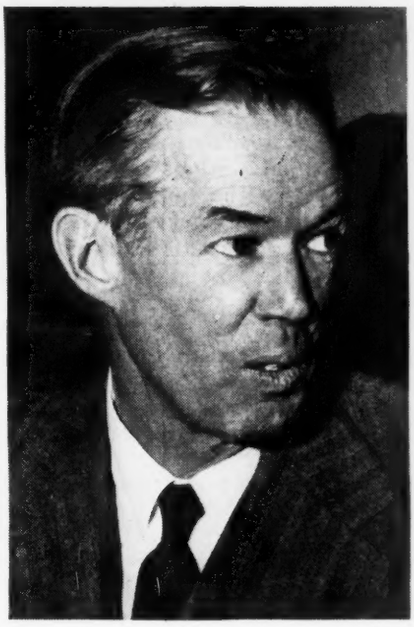
Mr. Lewis—"Assuredly the Mineworkers expect improvements."

The New Contract

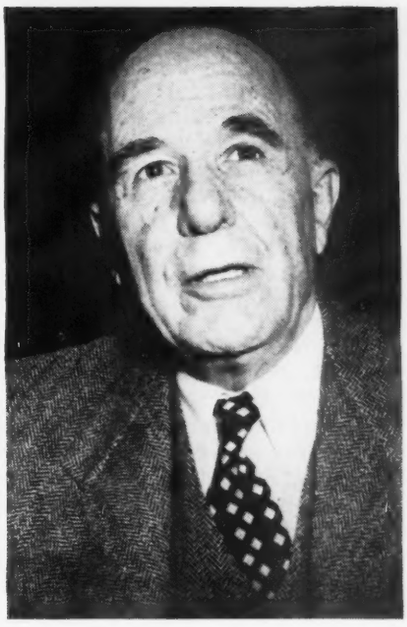
The Operators and Mr. Lewis—"In the interest of promoting harmony in the bituminous coal industry and to cause a cessation of the constant bickering that has beset the industry during the past year, the committee deems the agreement to be a respectable and reasonable one. No matter what the feelings of either side were about the law and the Fund, they have decided to cooperate with each other so far as they can in operating it successfully . . . Each side expressed a desire to bring about harmony and understanding between labor and management in the industry. As far as it was possible, the parties expressed a desire to cease public denunciation of each other."

(The quotations above are taken from proceedings of the Board of Inquiry, March 26-30; press dispatches; and Mr. Lewis' written answers to questions submitted by *Coal Age*).

SENATOR BRIDGES—"The settlement constituted an urgently needed public service at a time when the problem was being badly handled."



MR. MURRAY—"I thought that a plan could be proposed that would be actuarially sound."



JUDGE GOLDSBOROUGH—"The Court is unable to find anything . . . improper, unbusinesslike or not in accordance with . . . the Act . . . and the agreement."

Photos: Press Association, Inc., and Wide World.

Better Bargaining for Coal

Weaknesses in the Bituminous Bargaining Set-up Again Highlighted by Strikes and Bickering in 1948—How Operators and the Union Can Work Toward Peaceful Settlement of Differences and a Square Deal for All

THE LATEST COLLISIONS between the bituminous operators and Mr. Lewis over pensions and the new wage contract are further incidents in a too-long series of upheavals that have strained the nation's economy, tried the public's patience and canceled out, at least in some measure, the public-relations gains of the industry these past several years. To help the men responsible for directing the industry's course—operators' negotiators and spokesmen as well as union representation—in strengthening coal's standing as a respectable member of the nation's industrial family, a program is needed that will put an end to turbulence and uncertainty and insure peace and an uninterrupted coal supply. Such a program would accomplish the following:

1. Provide a bargaining technique that would give both operators and the union a fair shake at the bargaining table.

2. Improve negotiating machinery to assure a peaceful solution to differences without resort to strikes and name-calling.

3. Strengthen the industry's public relations.

4. Give the industry's customers a square deal.

Measured by almost any test, bituminous negotiations, especially in the recent past, leave much to be desired. Operator representatives have had to wrestle with problems that are perhaps thornier than those in any other industry. Many have been created by Mr. Lewis who, when he has not been putting a sprag in the wheel, has been throwing dust in the eyes of the operators and the public. Government officials have been eager to jump into the act and, backed up by laws that favor the labor leaders, have forced operators to grant concessions that have been open to question to say the least.

These and other obstructions, coupled with weaknesses in the operators' bargaining position growing out of the negotiating machinery itself, inadequate methods of getting public attention and a bargaining approach that resists demands instead of making reasonable proposals, have made negotiations difficult and often injurious to the industry and its relations with the public, in addition to producing contracts that have been hard to administer and which lead to additional controversy rather than peace.

Take only four tests by which the success of contract negotiations can be measured:

Test No. 1—How many contracts have been written without strikes or intervention by some outside agency?

In bituminous, only one contract—the Appalachian agreement of 1937—has been drawn up peacefully by the operators and union since 1933. In other years, there have been numerous end-of-contract stoppages to enforce union demands; half a dozen or more in-

terventions by the President or some administrative agency, usually resulting in little more than a wobbly truce; at least three appeals to the courts, leading to injunctions or to settlements that the operators and the union could not reach peacefully among themselves; and one contract, the 1947 agreement, growing out of talks between Mr. Lewis and two industrialists some distance removed from the bargaining table.

Test No. 2—Once a contract was written, have the parties worked peacefully together?

A round dozen mid-contract stoppages have occurred in the past 15 years and other threats to walk out have been halted only by pleas by the President, War Labor Board orders or federal court injunctions. In addition, there have been local wildcat strikes without number and much grumbling and bickering on both sides.

Test No. 3—Have negotiations produced contracts that were fair and acceptable to both parties and the public?

With gains outstripping all other workers, the miner can't complain. The operators and the public, however, have to pay the bills and in meeting the union's demands have granted concessions far outside what was heretofore considered the proper field of wages, hours and working conditions. Prices have been driven up faster than the increase in efficiency in the industry and both industry and the public have been hampered by interruptions in production. Mr. Lewis and government officials, backed up by the Wagner Act and the strike weapon, have exacted their terms without regard to fairness to operators and the public.

Test No. 4—Have negotiations been conducted on a high plane of good manners and dignity?

Wage talks have been colored by the threat or use of extreme economic pressure on the union's side and by stubbornness and name-calling on both sides. If there has been mutual effort to understand each other's views and reconcile them, if good manners and a conciliatory attitude have marked the talks in closed conference rooms, the public has been kept in the dark. In fact, statements to the press by responsible parties on both sides have created the opposite impression, which has not been modified by press releases recently issued either by the operators or by the union's public-relations agency.

The upshot, particularly in the past two years or so, has been an almost continuous upheaval in the industry, an out-of-patience public, a drift by users to other fuels, repeated government seizures growing into suggestions in some quarters outside the industry that the government ought to take over the mines, loss of profits to owners and stockholders and loss of wages to miners, not to mention the rise in mine accidents that inevitably accompanies strikes or the threat of strikes.

Disputes Bring in Outsiders

The birth of the pensions dispute, for example, dates back to the Krug-Lewis agreement of 1946, written after operator-union talks had broken down and including, among other concessions, provisions for a health, welfare and retirement fund. This commitment, plus provision for a pension fund to be administered by trustees and an increased levy on tonnage to support the fund, was carried over into the 1947 agreement, written by Messrs. Lewis, Fairless and Humphrey after wage talks again had broken down completely. Both times the welfare fund was a major issue leading to the collapse of negotiations. Both times negotiators took solid positions from which they would not retreat. Both times, the result was the elimination of the operators as parties to the writing of the contract.

However, whatever its strong and weak points, the operators accepted the welfare fund in principle, though not without some grumbling that even now finds public as well as private expression.

The pensions issue, at first involving only the three trustees of the fund but spreading into a major stoppage and reaching out to embroil the operators and bring a halt to contract talks, became a major stumbling block to peace in the industry and held up any use of the 1947 welfare fund. As early as January, differences between Messrs. Van Horn and Lewis had created a stalemate so hopeless that Mr. Murray, the neutral trustee, resigned. Later, in April, Mr. Murray was succeeded by Senator Bridges, another example—colored by political overtones in an election year—of an outsider (House Speaker Martin) muscling in and supporting Mr. Lewis against the operators. With that, the Bridges plan to activate the pension fund was adopted by a majority vote of the trustees over the objection of Mr. Van Horn, who immediately sued to block payments until questions of law were settled.

The joint wage conference, summoned in May by Mr. Lewis to consider terms for the 1948 contract, got nowhere, with Mr. Lewis insisting that operator negotiators must be acceptable to him and that the operators activate the 1947 fund and the Bridges plan as a condition precedent to writing a new contract. The operators took an opposing position. Judge Goldsborough, aptly terming the squabble over seating of Mr. Moody at the conference table as a "teapot tempest," quickly settled that dispute and, in a ruling June 22 dismissing Mr. Van Horn's suit to freeze the pension fund, "cleared away the underbrush," as Mr. Lewis and Mr. O'Neill agreed, and made possible the resumption of contract talks—not, however, until after hearings had been started by a Presidential fact-finding board with a view to forestalling a possible strike at the end of the miners' vacation period.

The public meanwhile was growing impatient with talks that got nowhere, tempers on both sides of the conference table had worn even thinner and a lot of dirty linen was getting a public washing. Then came the captive-mine imbroglio, again settled by an outsider—Judge Goldsborough. In the public interest, as well as for the good of the industry and the peaceful settlement of differences, this state of affairs never should have developed. It should have been possible, for example, for the two parties to have arrived at the union-shop settlement—leaving it to the NLRB and the courts for final decision—without the stoppage and the Goldsborough intervention.

In any fair appraisal of the events and attitudes leading to this situation, the blame must fall not on Mr. Lewis alone, whatever his faults. Also involved is the bargaining machinery from whose weaknesses he draws some of his strength, and the weak bargaining position, uncompromising attitude and public-relations awkwardness of the operators' representatives. A review of the regrettable aspects of recent events must include the following:

1. On his tacit admission, Mr. Van Horn offered no plan to activate the pension fund prior to June 11 and opposed all proposals submitted by Mr. Lewis and both neutral trustees. If at any time he did make a proposal, a statement to

that effect conceivably would have offset the general public idea that he, and therefore the operators he represented, aimed only at blocking the fund. Three of the other trustees—Messrs. Lewis and Murray and Senator Bridges—did make proposals, whatever their merits may have been.

Four actuarial studies were submitted to the trustees by three agencies. The very fact that their data and conclusions differed should have pointed to a middle ground where differences might have been reconciled and the contract's commitments to the miners fulfilled without work stoppages and outside intervention.

2. To substantiate his position that the welfare fund would support the Bridges plan, Mr. Lewis released the Latimer actuarial report to the press. Although Mr. Van Horn, supported by the operators' negotiating committee, held that the Bridges plan would bankrupt the fund, the actuarial data on which he based his stand were not made public. With data from one side and none from the other, the press and the public were left to believe what they would about the merits of Mr. Van Horn's position.

Actuarial Data Questioned

Indeed, Mr. Lewis' position was strengthened by the fact that the Latimer report stressed, among other things, the following alleged errors in other actuarial studies: (1) they covered the age of miners only, without consideration of length of service, age of entry or withdrawals from service; (2) they assumed that every miner would retire immediately if he was over retirement age; (3) they underestimated the income of the fund; (4) they overstated the number of eligible and potentially eligible miners; (5) they assumed mortality rates that cannot be applied to miners; (6) they made no allowance for termination of employment for reasons other than death. In addition, the Latimer report made capital of the differences between the first and second of two reports submitted by one agency. Mr. Latimer, who formerly was chairman of the Railroad Retirement Board, concluded that the Bridges plan was sound and workable.

3. The immovable positions taken by Messrs. Lewis and Van Horn did not signal a conciliatory approach to their differences and their unwillingness to retreat brought in, at last, an outsider—Senator Bridges—with the results cited earlier. Under the plan finally effected, Mr. Lewis' original demand for $20,000,000 set-aside for pensions to 60-year-old miners with 20 years of service retiring after June 30, 1942, was replaced by a $5,000,000 set-aside for those retiring after May 28, 1946.

Mr. Van Horn again made no proposal of his own, opposed the Bridges motion and asked that U.M.W. members who were not employed by operator signatories to the contract be barred. He was outvoted by the other trustees and overruled by the courts. Mr. Lewis' acceptance of the Bridges plan, which scaled down his original demands, suggests that he at least might have weighed a reasonable proposal by Mr. Van Horn and that a settlement was possible in the area between the two extremes.

4. Mr. Lewis took no action on Mr. Van Horn's nominations for a trustee to succeed Mr. Murray in February and, according to Mr. Van Horn, failed as chairman of the trustees to share information as to the signatories to the 1947 contract, agenda for forthcoming meetings and the time and place of contemplated meetings. In this attitude, together with his extended absence from Washington while the dispute remained unsettled, Mr. Lewis showed little desire to get on with the job on a friendly basis.

5. Although Mr. Van Horn, as trustee of a charitable fund, was not obliged to seek the advice of the operators — nor were they obliged to offer recommendations—it was within their rights to consult on a course of action. However, in spite of the deadlock that was clearly developing and a strike that paralyzed the industry in March and April, the operators permitted 11 months to elapse between the signing of the 1947 agreement and their offer to June 9, 1948, to recommend a course for Mr. Van Horn. Meanwhile, the industry, the miners and the public alike suffered.

6. When, at last, the operators did make an offer covering wages and hours and including a pattern for the 1948 pension fund, which they offered to recommend to their trustee for activating the 1947 fund, it was an offer that Mr. Lewis could hardly have been expected to consider, even as a basis for negotiation. Four elements in the operators' proposal offered no gains the miners had not already won: (1) pensions, previously provided in the 1947 agreement but not yet activated, were offered again; (2) the union shop, already of long standing in the industry, was to be retained; (3) the welfare levy of 10c. per ton would have been carried forward; and (4) the same wage rates would have been retained.

Miners Asked to Retreat

In six other directions, the operators asked the miners to give up gains embodied in the 1947 contract or included in the Bridges plan: (1) liberal vacation rules; (2) double time for work on the seventh consecutive day; (3) a provision forbidding midweek layoffs to escape time-and-a-half for a sixth day; (4) the "able and willing" clause; (5) the memorial-period clause; and (6) certain details of the pension plan, including (a) exchange of the $100 a month straight payment for $100 a month with social-security and old-age benefits, (b) exchange of the age requirement of 62 years for one of 65 years and (c) exchange of union membership as an eligibility requirement for employment by a signatory operator. In addition, the miners were asked to accept a clause forbidding all gainful employment after retirement—a limitation not imposed by the Bridges plan.

On this basis, it would have been difficult, to say the least, to persuade Mr. Lewis that the operators' proposals showed a willingness to meet him at least part of the way.

7. Mr. Lewis offered to keep the miners at work after their vacation period pending negotiation of a contract if any gains the miners might win were made retroactive to July 1 and if the 1947 pension fund were activated immediately. There was some basis for the operators' view that retroactivity would require building up a contingency fund and would be a strong bargaining lever for the union. However, retroactivity is not unknown in coal contracts and has been applied without undue hardship. And in any event, it is doubtful that Mr. Lewis, even with the help of retroactivity after July 1, could have won more than he did win when the operators surrendered June 24.

As for activating the pension fund prior to talking 1948 contract terms, Mr. Lewis' stand, though not calculated to shed sweetness and light around the conference table, was reasonable from his point of view, at least. The pension fund was still blocked and the operators had shown no disposition to recom-

mend a course of action to their trustee. Small wonder, therefore, that Mr. Lewis asked for the completion of unfinished business before taking up the new contract. At best, there could have been little hope for smooth relations under the new agreement until issues under the old contract had been settled. However, Mr. Lewis, under the general clause of the 1947 contract calling for free collective bargaining as a means of resolving national disputes, could have moved earlier for a conference looking forward to a settlement. That he did not leads to speculation that he was more interested in ramming something through by pressure and picked the 1948 negotiating sessions as the best time to do it.

However, prior to the court's decision on June 22, there appeared to be no disposition on the part of the operators to consider Mr. Lewis' proposal to continue talks after July 1 if a contract was not written by that time. A willingness to continue the conferences under one condition, or even both, conceivably could have helped things along to a settlement even before Judge Goldsborough's ruling.

8. A critical question in the 1948 wage conference was whether the 1947 welfare fund should take over commitments carried over from the 1946 fund. Mr. Lewis, up to a late date in the negotiations, failed to show how the 1946 fund had been spent or how extensive were the commitments he asked the 1947 fund to take over. Meanwhile, the operators charged on the one hand that the spending had been extravagant and on the other that they could not get the facts from Mr. Lewis. For his part, Mr. Lewis showed more disposition to declaim and make unsubstantiated charges against the operators than to put the facts on the table.

A study by both sides of the facts, including disbursements from the 1946 fund, a fair sampling of distress cases and the extent of commitments against the 1947 fund, might well have paved the way to a workable agreement. The fact is that the 1947 agreement provided for distress payments from the fund. The operators' assent to that contract was an admission that distress cases do exist and should be cared for. Taking care of such cases was much more important than a debate over who made the commitments.

9. After the major terms of the 1948 contract were agreed upon, including a wage boost of $1 a day, doubling the welfare levy to 20c. and other concessions, all of which signaled the complete surrender of the commercial operators of their June 9 proposals, Mr. Lewis pressed his advantage and demanded further fringe concessions, using methods which, operator spokesmen declared, "disgusted" them. It is doubtful if this move, at a time when a spirit of temperance and cooperation should have prevailed, contributed anything to a willing acceptance of the contract terms or the long-range efficacy of wage negotiations.

10. Although sorely tried by Mr. Lewis' methods and forced by fear of a strike to capitulate, the only course left to the operators, for the public record, at least, was to accept the contract with all the good grace they could muster, with assurances to the miners and the public of their desire to make the agreement work and of their pride in the fact that the men who work in their mines stand at the top of the nation's industrial workers. The operators did issue such a statement jointly with the union after the contract had been signed. Immediately beforehand, however, operator spokesmen had declared that they would accept "reluctantly" the "onerous" terms of the agreement and their formal statement with the union is difficult to reconcile with previous declarations—and with some still being made. These provide Mr. Lewis with still more ammunition to fire at the operators —and it is not helping the situation to find that he still is quite willing to use it.

This, then, is the record to date. It is not a flattering one, to say the least.

It is easy to say that this is water over the dam. The point is that this same water has been running over the dam a long time, getting muddier with each passage. For the sake of all concerned, some means must be found for bringing operators, their negotiators and the union together to assure fair bargaining, fewer strikes, a continuing high standard of living and a measure of security for miners, a higher plane of public relations for the industry as a whole and a fair shake for coal's customers.

The initiative and the major part of the task of mending the industry's ways must fall to the operators, whose investment in Bituminous Coal Institute and expenditures for better labor relations at the company level cannot pay off in full until some stability is brought to contract negotiations. Though Mr. Lewis has a winning machine and might not be disposed to cooperate, a conciliatory approach, seldom tried by the operators thus far, might conceivably provoke a response in kind. However, whether Mr. Lewis lends his good offices or not, the big problem is reconstruction of good relations and effective bargaining machinery on the national level.

Succesful bargaining, measured by the tests outlined earlier in these pages, can take place only if both sides come to the conference table with (1) equal strength, (2) all the facts, (3) a conciliatory frame of mind, (4) a sincere desire to serve the best interests of all concerned and (5) an affirmative, constructive set of negotiable proposals. To bring about fair bargaining and better contracts, there are courses of action open to the operators and the union and to the two parties together.

A Program for the Operators

Since, as a practical matter, the operators cannot expect to cut Mr. Lewis down to size, their best hope of meeting him on equal terms is to match his strength with unity among themselves, aggressiveness and shrewdness at the bargaining table and carefully guided public relations before, during and after the negotiations. Resort to suits and injunctions is more than a symptom of Mr. Lewis' power and intractability. It is a symptom also of weaknesses in the operators' bargaining position and the machinery they have set up to work out contracts. A plan to strengthen their bargaining position, improve their machinery and assure smooth negotiations and fair contracts, together with better public opinion, might include the following:

1. Reducing the number of operator representatives, authorizing them to make committments without fighting delaying actions while consulting their constituents and asking them to function on a year-around basis in labor relations, public relations, contract interpretation and industry economics. In addition, this group, like the anthracite Committee of Twelve, would maintain liaison with union headquarters. Furnished with facts by the industry's own agencies and from other sources and supported by skilled specialists, a permanent

committee of operators coming directly from the industry could do a constructive job of making the contract work throughout the term. Possible results at the conference table, where contracts are written, would be a broader understanding by both parties of the problems on both sides, fewer special interests among operator representatives and therefore a more solid front, fewer personal clashes because fewer people would be involved and, in the end, shorter contract negotiations.

Going still further, it has been suggested in some responsible quarters in the industry—and by such as Judge Goldsborough without—that authority to act for the operators the year around be lodged with a single representative, employed full time and selected for his knowledge of the industry and his ability as a negotiator.

2. Naming progressive men (or a progressive man), skilled in human relations and temperamentally suited to negotiation, to represent the operators. Patience, shrewdness, broadmindedness, a sense of humor and proportion, an understanding of human nature, an appreciation of public opinion as a source of strength, and skill in creating favorable public reactions and a favorable climate at the conference table are the essentials of a good negotiator.

3. Preparing, in advance of contract talks, to make affirmative, constructive proposals. Shrewdly, Mr. Lewis has kept the operators on the defensive most, if not all, of the time. A proposal at the start of the negotiations, based on what Mr. Lewis reasonably could be expected to ask for, and calculated to show good faith and indicate that the mine owners are willing to share the gains of progress in the industry with the men who mine the coal, would be a step forward in regaining the initiative.

4. Setting up a public-relations program geared to negotiations and organized specifically for that purpose. A public-relations agency, committed to the idea that truth, without qualification or innuendo, is the first requirement of success, could render a real service to the industry as well as the public. On the long-range front—gradual education of the public—B.C.I., following these precepts, has made real strides. The big need now is a similar agency to release spot news covering the issues and the day-to-day progress in wage conferences—and to take the truth to the miners.

5. Approaching wage negotiations in a conciliatory frame of mind, prepared to give and take, look at the issues from all sides and accept with good grace the final reconciliation of differences.

6. Avoiding all appearance, nationally and locally, of attempting to "weasel" on the contract terms and being quick at all times to answer any such allegations with facts.

7. Accepting the union as a potential force for good in the industry and its leaders as men honestly seeking gains for the miners they represent.

8. Adding strength to local efforts to cement good labor relations by fair play, personal interest in miners and dedication to the improvement of their living and working conditions.

A Program for the Union

Mr. Lewis draws his strength from the 350,000 miners who go down the line with him. No one quarrels with him or his miners for that unity. Indeed, as Judge Goldsborough said, it might well be an example to the operators. Mr. Lewis' use of the strike weapon upon the slightest or no excuse, however, is a resort to brute force that is unfair to the industry, the operators, the public and, in the long run, the miners themselves. In the interest of all concerned and as his share in rebuilding the industry's respectability and contributing to smoother contract relations, Mr. Lewis should:

1. Abandon indiscriminate use of the strike weapon to enforce his demands.

2. Keep his demands within the ability of the industry and its customers to pay the price and within the laws covering labor contracts and fair bargaining practices.

3. Abandon his one-sided dictation of bargaining-table procedures and the terms of contracts.

4. Approach negotiations in a conciliatory spirit; conceding management's share and interest in industrial stability, high wages and good living and working conditions for the miners.

5. Make a real effort to keep the contract working effectively for all parties throughout its life.

A Joint Program for Both Parties

Neither the operators nor the union can do the whole job of reconstructing the national labor-relations approach alone. However, if both sides show their good faith by real effort to change their ways, there is good reason to hope for peace in the industry. Once good faith is shown on both sides, operators and the union together can create a friendly climate for collective bargaining by acting along these lines:

1. Reducing the length of the negotiating period by: (a) stating proposals in writing prior to sitting down at the conference table, thus permitting prior study and the preparation of counter-suggestions with supporting data; (b) restricting debate to relevant issues; and (c) setting up a joint liaison committee to meet throughout the year to discuss industry problems and settle fringe issues and minor disagreements, thus reducing the tasks of the joint wage conference and reserving to it the most important items.

2. Opening the joint wage conference to the press and the public, since negotiations admittedly are in the public interest. Open meetings would place a damper on intemperate accusations and would tone down personal clashes that have slowed progress in previous wage talks.

3. Approaching the conference table ready to accept the fact that fairness to all may lie between the two extremes.

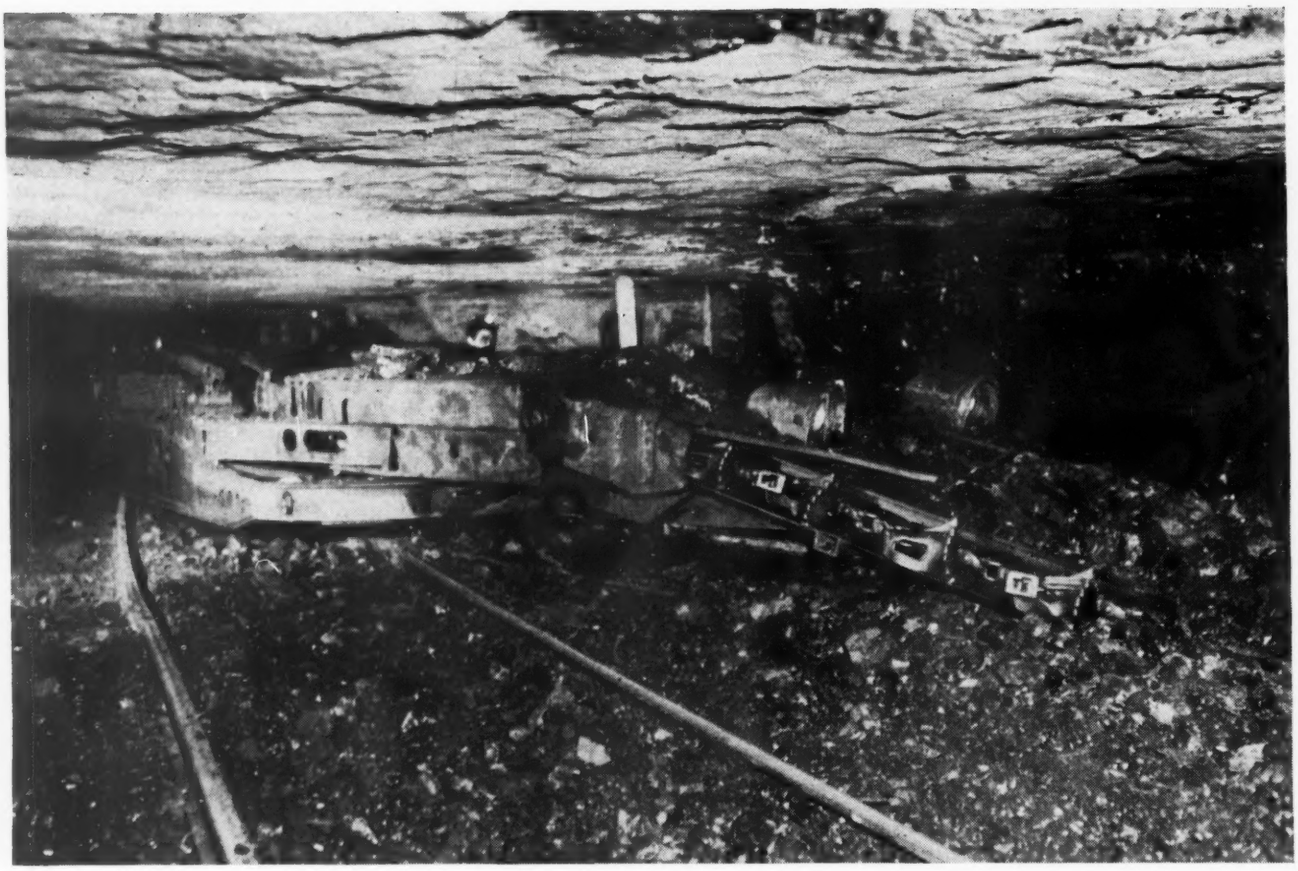
4. Maintaining a high level of good manners and consideration for the other fellow's viewpoint before, during and after contract talks.

The operators have a right to protect their interests and those of the stockholders and to state their views and take a position, both publicly and at the conference table without being villified and bulldozed.

The miners have a right to fair consideration of any proposals they put forward looking to better working and living conditions for themselves.

The public, including coal's customers, has a right to uninterrupted coal supplies and the goods and services coal provides at prices fair to all.

In justice to all, the men who guide the industry's course should move to these ends.



TRACK-MOUNTED UNIT loading the first cut of a crosscut.

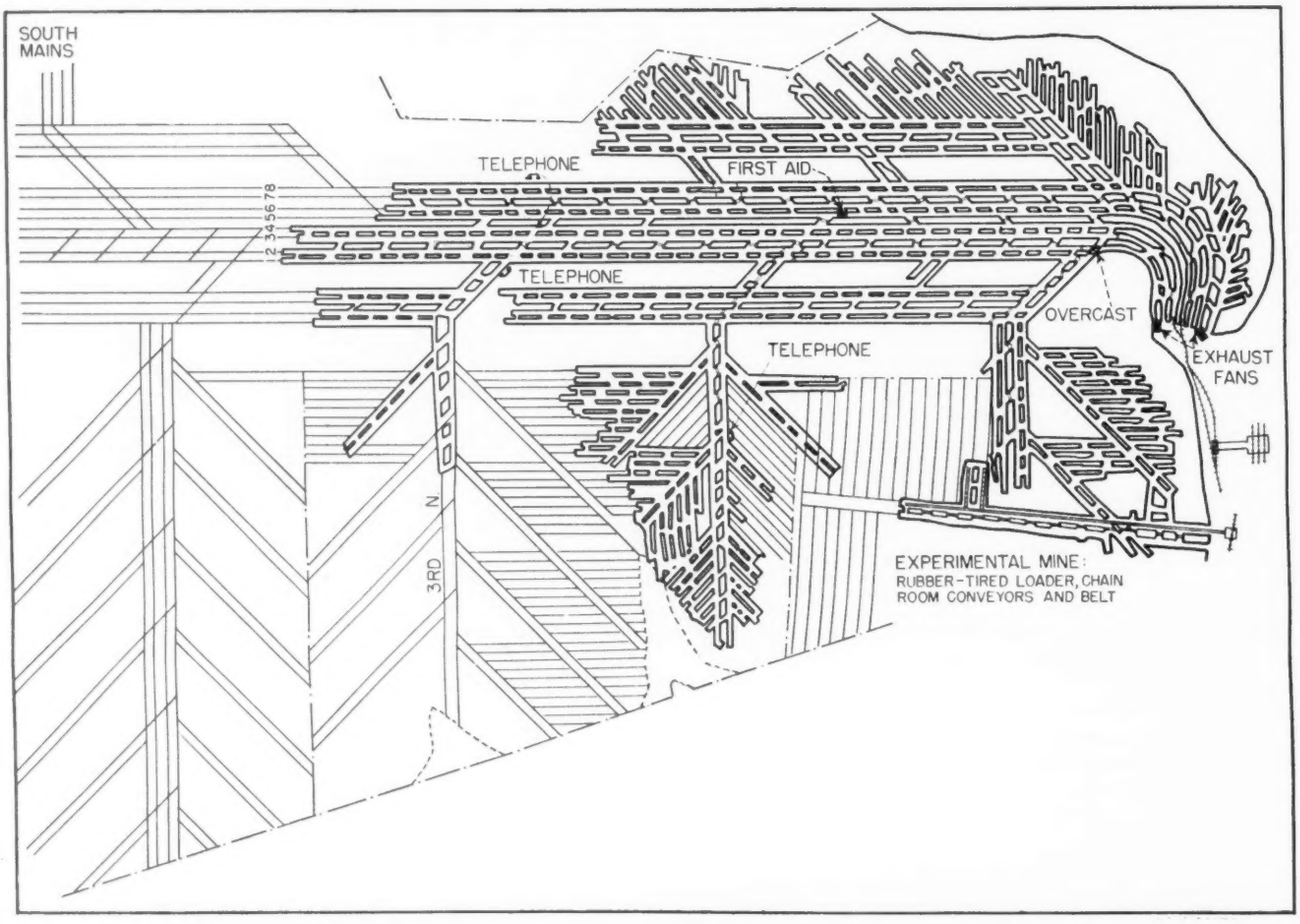
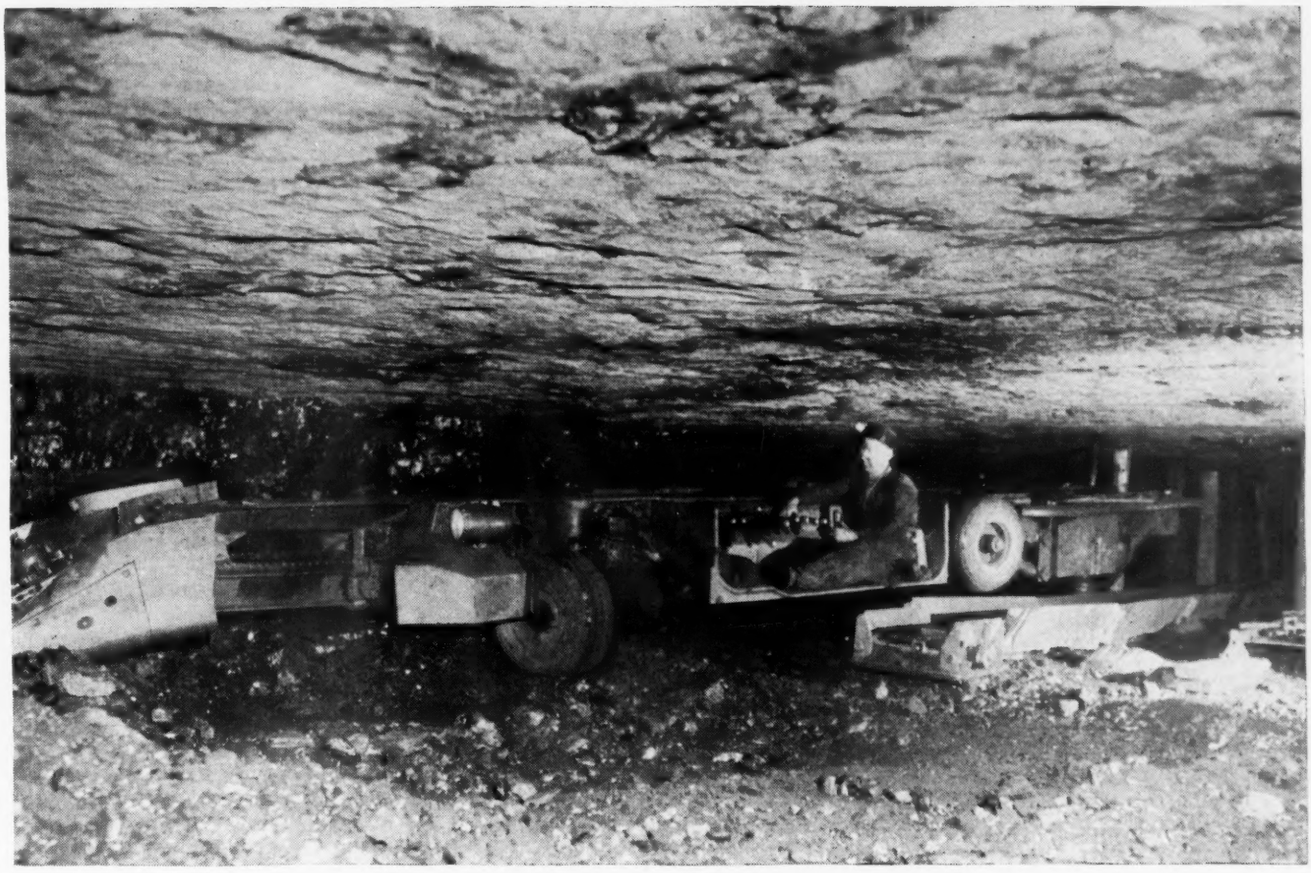


FIG. 1—MIDDLE CREEK MINE, Floyd Elkhorn Coal Co. A separate mine for the conveyor loader is at the lower right.



NEW RUBBER-TIRED MACHINE loading to a chain conveyor in a 35-ft. room.

New Mine—High Efficiency

Middle Creek Mine in 54-In. Elkhorn Seam Ships Over 12 Tons Per Man on Payroll With Track Loaders—Rubber-Tired Machine in Test Section Loads 24 Tons Per Face Man—Mine Developed With Twin Haulways and Fans

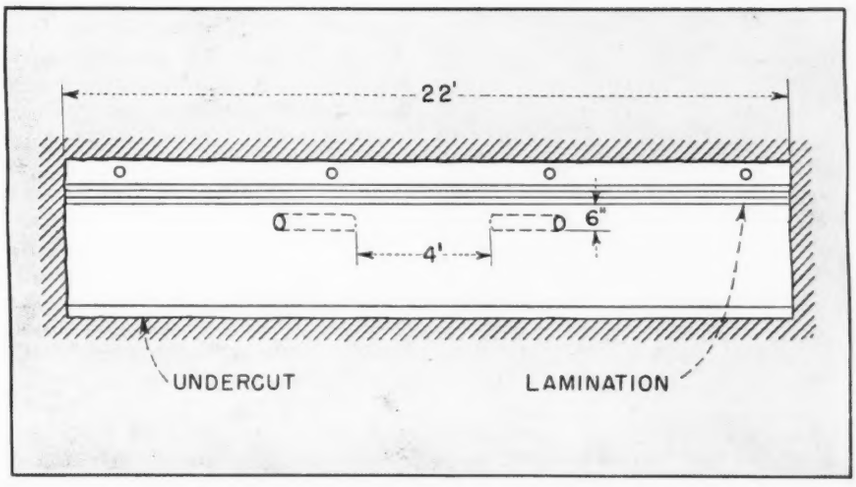
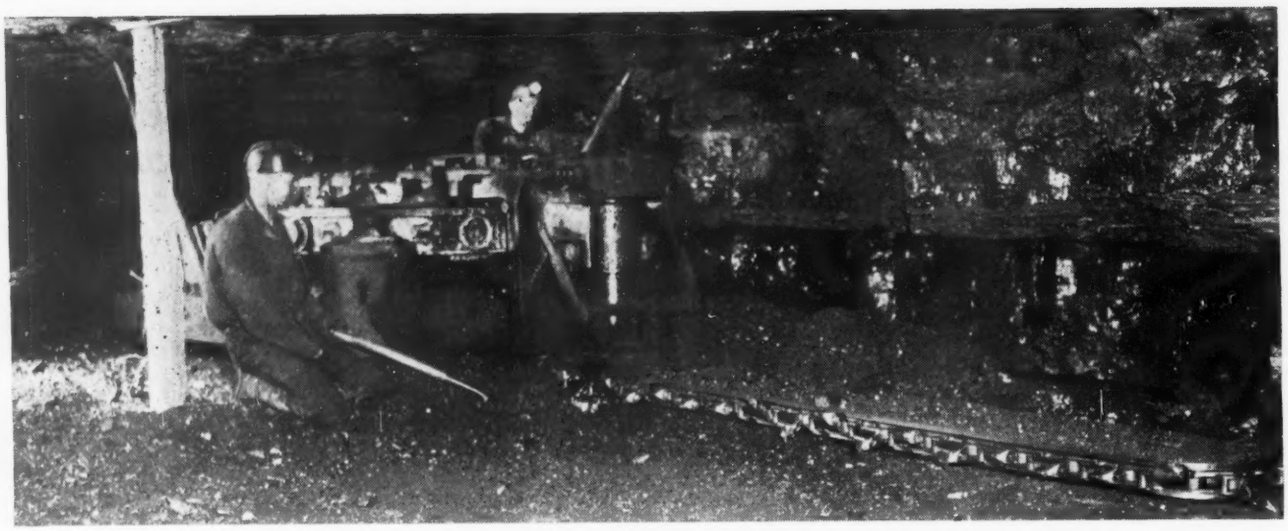


FIG. 2—DRILLING PATTERN for the track-mounted loaders.

OPERATING in a seam averaging 54 in., the new Middle Creek mine of the Floyd Elkhorn Coal Co., Floyd County, Kentucky, is now producing 12.3 tons per employee, including the general mine foreman and all outside labor. Two track-mounted loaders deliver directly to drop-bottom mine cars. In an entirely separate section with haulage by chain and belt to the outside and set aside for developing—the best ways of using a new rubber-tired loader—the average since its installation Oct. 1, 1947, has been 24 tons per faceman per shift.

The Floyd Elkhorn company is one of several headed by C. D. Reed, of Drift, Ky. Including Middle Creek and mines on Beaver Creek, the organization mined 1,028,028 tons in 1947 and sold over 1½ million, making it the third largest operator in the Big Sandy-Elkhorn field. B. F. Reed is secretary-treasurer of the organization and M. K. Reed is superintendent at Floyd Elkhorn.

Middle Creek mine, of which J. P.



TRACK-MOUNTED CUTTER starting to undercut a crosscut.

WITH 39 MEN employed, Middle Creek mine ships 480 tons per day. Supports for trolley wires and for a pole line carrying low-voltage feeders were built from scrap pipe.

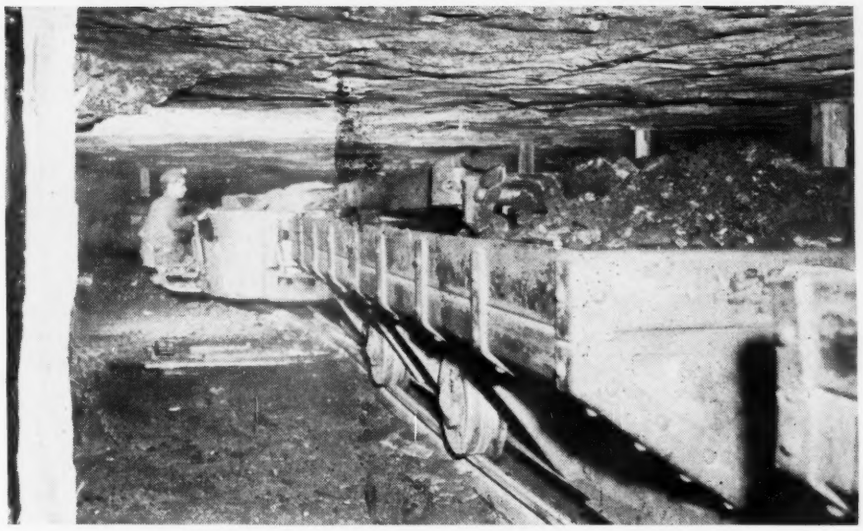
TWO JEEPS save time and energy of mine officials and repairmen. J. P. Sammons (left) is mine foreman; W. B. Parker, assistant foreman; and M. K. Reed, superintendent.

Sammons is general mine foreman, is on the Middle Creek spur on the C. & O. Ry., eight miles southwest of Prestonsburg. Here, the Elkhorn No. 1 seam, lying practically level, outcrops at tipple height and ranges from 40 to 60 in. It includes, 6 to 11 in. down from the top, a band of laminated coal and slate ranging from a trace to 11 in. in thickness. The roof is very strong slate, but during a summer as much as 3 in. flakes off and comes down on the intake airways. The bottom is a very hard slate. Maximum cover over the present workings is 200 ft., but there are places on the 1,100-acre lease where it reaches 600 ft.

Maintenance Costs Low

The mine was opened Oct. 1, 1944, with two Jeffrey L-500 track-mounted loaders and to date has been operated exclusively with these units. Up to Feb. 1, 1948, when the accompanying illustrations were made, the two machines had loaded a total of 370,119 tons, with a pleasingly low maintenance cost. Mr. M. K. Reed pointed specifically to the fact that neither machine has required an armature renewal or rewind.

Bottom cutting in the coal is done with two Jeffrey 29L track-mounted machines with 8-ft. cutter-bars using Prox bits. Plans are underway, however, to cut the parting out. All drilling is done with one Jeffrey 26A track-mounted drill. The coal is hauled in 30 A.C.F. drop-bottom cars which are loaded to a 3-ton average. One 6-ton reconditioned cable-reel locomotive serves each loader and the car-change distance is 90 to 180 ft.



TRACK-MOUNTED LOADING MACHINE delivers to 3-ton drop-bottom cars.

All entries are driven 22 ft. wide and the shooting pattern consists of two snubbing holes near the center, shot simultaneously, and four holes between the parting and the top, these four shot later and simultaneously. King Red Crown permissible in 1¼x8-in. sticks is used for shooting.

Rooms are turned at a 45-deg. angle on 35-ft. centers and the room pillars are left in place. The mine is exceptionally free of water.

Mine Works One Shift

In line with the general policy of the Reed interests, the mine is worked one shift only. However, a shortage of d.c. power has made it necessary to cut and drill in one of the sections at night.

The eleven-man crew of a unit consists of two loading-machine operators, two machinemen, one driller, one shooter, two trackmen, one timberman and the two men of the motor crew. For the two crews there is one boss. Therefore, 23 men operate in two sections. Counting the boss, the average production of 480 tons per shift works out to approximately 21 tons per man-shift on the section.

Thirty-nine men constitute the mine payroll. In addition to the 23 already mentioned, there are six company men working underground, one general mine foreman, six tipple men and three electricians. One electrician works day shift and two at night. One of the latter greases and inspects the machines.

All rails, including those on the main line and in the rooms, are 40-lb. The mains have been developed to 4,000 ft. From the portal to a point 3,500 ft. in the main line is double-tracked in separate parallel headings. Three 6-ton cable-reel locomotives comprise the total motive power for the gathering and main-line haulages. Track gage is 42 in. All ties on the main line are composite; that is, a steel tie on a 3x8-in. by 5½-ft. oak tie. The projection calls for the mains to be driven straight for 2½ miles to the boundary line.

The mine, as indicated by the accompanying map, is developed in two sections. Each is ventilated by its own separate fan. In reality the main entry comprises 16 parallel headings. Of the center group of eight headings, Nos. 1, 2, 7 and 8 are return aircourses and 3, 4, 5 and 6 are intakes. The two-fan arrangement eliminated many doors and overcasts. The sixteen headings reduce air friction and, consequently, ventilation power cost.

Use Mobile Rock Duster

Aside from the cutters, drill, loaders, cars and locomotives, there are but two other types of mobile equipment—an M.S.A. rock duster and two mine jeeps. One of the jeeps is a Lee-Norse and the other was built in the mine shop.

Coal is carried from the car-dump hopper down, on the outside, to the three-track tipple by a Jeffrey chain conveyor of standard underground type but with sideboards added. The pitch is 30 deg. Screening is done with a mechanical vibrator and picking is done at three points. Three men pick on the egg chute, one on the lump chute and one on the run-of-mine feeder.

One 150-kw. converter furnishes all of the d.c. power (275 volts) for the mine and also for the adjoining conveyor-loader section. Plans call for early installation of a second substation unit which will be a 300-kw. converter. At the portals, three I.T.E. automatic breakers protect the equipment. Two more of these breakers are on hand and will be installed underground on branch feeders.

An area 1,000 ft. by 1,500 ft., next to the outcrop, was set aside for mining with the new rubber-tired loader, which is the Jeffrey 61 CLR unit, designed especially for low seams and for loading onto conveyors (*Coal Age*, January, 1948, p. 80).

Starting at the outcrop, a two-heading entry was developed 1,100 ft. and a Jeffrey 36-in. belt installed. This belt is now 1,050 ft. long and the drive is on the outside at the railroad-car loading point, which is 300 ft. from the main tipple. Rooms 35 ft. wide and 250 ft. long are being driven in pairs off of this main entry, using chain conveyors between the loader and the belt. Bottom cutting is done with Goodman standard shortwalls, one in each of the two working places in the mine.

High Output Per Faceman

Eight of the thirteen men employed at this separate mine were included in arriving at the over-all figure of 24 tons per faceman per shift. The loading machine averages 192 tons per shift and has hit a peak of 260 tons. Two of the eight men comprise the loading-machine crew, two men do the cutting, two men drill, shoot and pan-up, one handles supplies and one is an electrician.

Five other men complete the mine payroll. One working underground picks on the room chain conveyors, two work outside at the railway-car loading point and one is a boss or foreman.

Principal features of this new loading machine are low height (24½ in.), rubber tires, swivel front wheels, retractable rear wheels, hydraulic drives and a boom having a swivel tail jack so that the coal discharges into the conveyor without attention on the part of the operator or helper. The telescoping loading head has a reach of 12 ft. beyond the point where it can begin loading. Judging from experience in loading 13,000 tons, officials of the Floyd Elkhorn Coal Co. think that the new loader promises a favorable maintenance cost.

FOUR STRIPPING SHOVELS working close together make second cut after first has been loaded. Bench, upper left, was made by bulldozers and pans, which initiated stripping by removing the top soil.

Concentrated Stripping

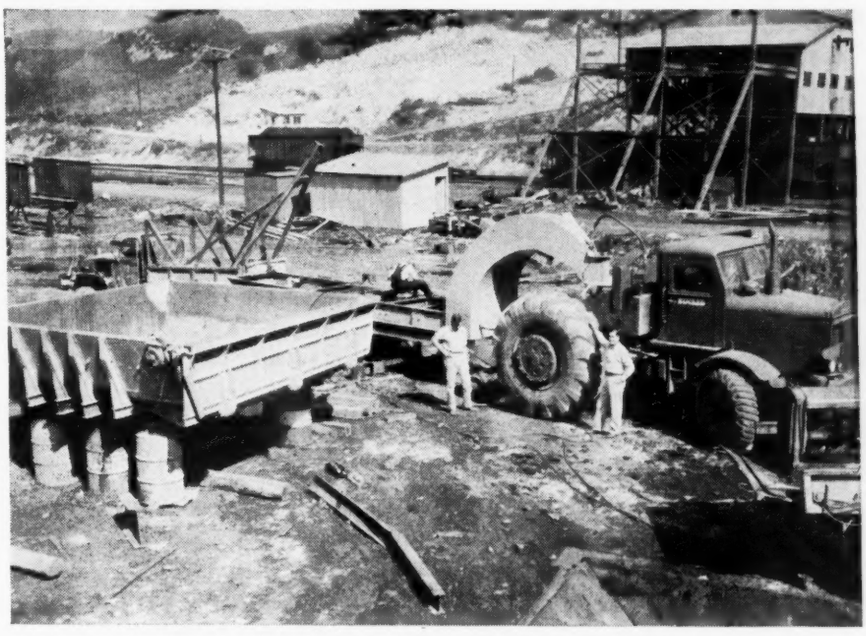
Grafton Coal Co. Strips and Levels in One Operation—2½- and 3½-Yd. Shovels Load Spoil Into 27-Yd. Rubber-Tired Rock Wagons Which Dump Without Stopping—Concentration of Equipment in One Pit Promotes Economy

TWO SHOVELS LOADING ROCK into crawler-mounted wagons.

TWO COMPLETE SETS OF EQUIPMENT side by side feature the Grafton Coal Co. tipple. Duplication facilitated speedy construction of the plant. Each side has a capacity of 600 t.p.h.

By J. H. EDWARDS
Associate Editor, Coal Age

WHEN the Pepper strip mine of the Grafton Coal Co., near Clarksburg, W. Va., was being opened, a goal of 100 railroad cars of coal on the 100th day after breaking ground was set. That goal was nearly reached. At this 5,000-ton mine, owned by 33-year-old Charles Compton, president, who started working with a construction company at 13 years of age and seven years ago was operating a shovel, concentration is the keynote. Four shovels often strip simultaneously in one pit and three shovels load abreast. The latest acquisition in overburden-handling equipment consists of five 27-cu. yd. 40-ton rubber-tired side-dump wagons built on the site.



BUILDING THE FIRST 27-yd. rubber-tired side-dump rock wagon.

Stripping is along the outcrop in hilly country where taking 50 ft. of cover bares a marketable width of 100 to 200 ft. of Pittsburgh coal, here ranging from 6 to 9 ft. in thickness and lying 1,200 ft. above sea level. For the most part, the seam has not been mined underground in this territory. Twenty-five feet above it lies the Redstone, 5 to 6½ ft. thick, which is spotty in quality and is recovered only in places where the coal is good and conditions favorable.

The tipple is in Barbour County on a new 1½-mile spur from Brownton which, in turn, is on the Bear Mountain Branch of the B. & O. Ry. The location is only 10 miles air-line southeast from Clarksburg. The 100-day construction and development period dated from Sept. 2, 1946, when building of the spur track was started. The first edition of the tipple, containing the bare necessities for feeding, elevating, picking and loading mine-run, went into service Dec. 9, 1946. Subsequently, without stopping production, the tipple has been expanded and equipped until it includes two duplicate sets of equipment for picking, crushing

Hauling Rock in Side-Dump Wagons

LOADING ROCK into the first 27-yd. rubber-tired side-dump wagon.

DUMPING 40 TONS of rock over the shoulder without slowing down.

LOADING THE NEW TYPE (second-design) 27-yd. rock wagon.

and screening the strip-mined coal.

R. L. Satterfield, vice president, is in general charge of operations and has his well-equipped and pleasant office in a reconditioned farmhouse of imposing proportions in which the former owner of the farm resided until recently, when he sold out to the coal company. Names and duties of other salaried employees of the company are given elsewhere in this article.

The Penn-Dola Coal Co., composed of the same interests and managed by Messrs. Compton and Satterfield, owns 3,000 acres of land and coal and operates a strip mine near Lumberport. Sales of rail shipments are handled by the Sitnek Fuel Co., Philadelphia.

Before stripping, a survey is made and a map prepared showing elevations and contours of coal and overburden and locations of gas lines, transmission lines and old mine workings. Exploratory work consists principally of crop openings made with a bulldozer. Where doubt exists, core drilling is done.

The following list of pit and haulage equipment gives a general idea of the methods followed in stripping, loading and hauling:

1 Lima shovel, Model 1201, 3½-yd., 32½-ft. boom, 22-ft. stick.

2 Manitowoc Speed-Shovels, 2-yd., 45-ft. booms, 35-ft. sticks; stripping only.

1 Marion shovel, Model 392, 2½-yd., 25½-ft. boom, 18-ft. stick.

1 Northwest 80D shovel, 2½-yd., 22-ft. boom, 16-ft. stick; stripping and loading into rock wagons.

2 Lorain Model 82 shovels, high-lift front, 2-yd., 22-ft. booms, 22-ft. sticks; stripping and coal loading.

2 Bucyrus-Erie 44B shovels, 2-yd., high-lift front, 22-ft. booms, 22-ft. sticks; stripping and coal loading.

1 Lorain shovel, Model 75, 1¾-yd., with Model 77 front; coal loading.

5 rubber-tired side-dump rock wagons, 27-yd., 40-ton, made by the coal company and pulled by Euclid rubber-tired units.

8 Caterpillar D8 bulldozers.

4 LeTourneau Carry-All pans, 15- and 18-yd. capacities.

1 Caterpillar D6 tractor with hydraulically controlled blade; cleaning coal.

1 International W6 rubber-tired tractor with Hough broom; sweeping coal.

1 Warco tandem-drive road patrol.

1 road-sprinkling tank truck, 4,500-gal., pulled by Mack tractor.

16 Mack trucks, 20-ton.

3 White trucks, 20-ton.

Cover Removed Up to 60 Ft.

15 International trucks, 12-ton.

5 G.M.C. trucks, 10-ton.

5 Parmanco highwall-drilling machines, 6-in.

6 Hardsocg highwall-drilling machines, 5-in.

1 Parmanco vertical coal drill, 4-in.

3 Schramm compressors, 105-c.f.m., truck-mounted.

1 Gardner-Denver compressor, 105-c.f.m., truck-mounted.

7 Rex Speed-Prime pumps, the Chain Belt Co., 2-, 3- and 4-in.

3 Sterling pumps, 2-, 3- and 4-in.

1 Army field light, 6-lamp, rubber-mounted, with Marble-Card 32-volt d.c. generator driven by LeRoi gasoline engine.

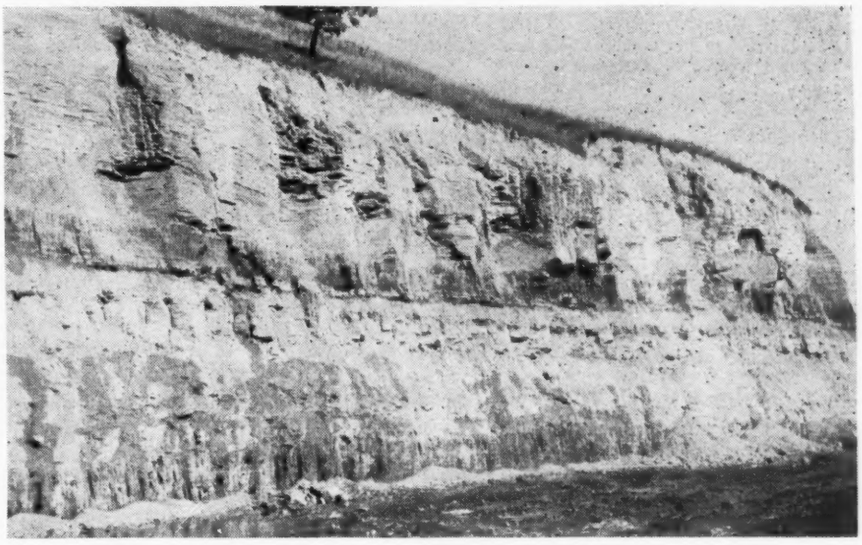
Character of the strata overlying the Pittsburgh seam at Pepper mine varies widely over short distances. For the most part, there is 7 ft. of soapstone above the coal in the present workings, then 5 ft. of limestone, topped by sandstone up to the Redstone seam. In some places, there is a semi-sandstone immediately above the Pittsburgh, and in others many feet of hard fireclay which contains limestone boulders 2½ to 5 ft. across. Above the Redstone the cap is limestone in some places and in others a hard slate up to the top soil. In the fireclay above the Pittsburgh, water seams often are encountered.

When the equipment is available bulldozers and pans usually initiate the stripping by removing the top soil. When so doing, they push it well down the hillside below the Pittsburgh-seam level. After that, stripping usually proceeds in one of two ways:

1. A lead shovel casting as far as possible takes all of the overburden up to formation where shooting would be required. The highwall is then about 20 ft. high and a 35-ft. width of coal is exposed, which then is loaded out. Sidewall drilling to a depth of around 100 ft. and shooting of these holes are the next steps. Shovels then strip that width, casting as much as possible into the 35-ft. pit from which the coal has been removed but leaving openings through the spoil banks about every 200 ft. Through these openings, the remainder of the overburden is hauled from the shovels by the rubber-tired 27-yd. wagons, thus finishing up with a fairly level spoil.

2. With this method, drilling follows opening up with the lead shovel. The first 35-ft. width of coal is left in place temporarily. Stripping of the remainder is done as in Method 1 but exposing for

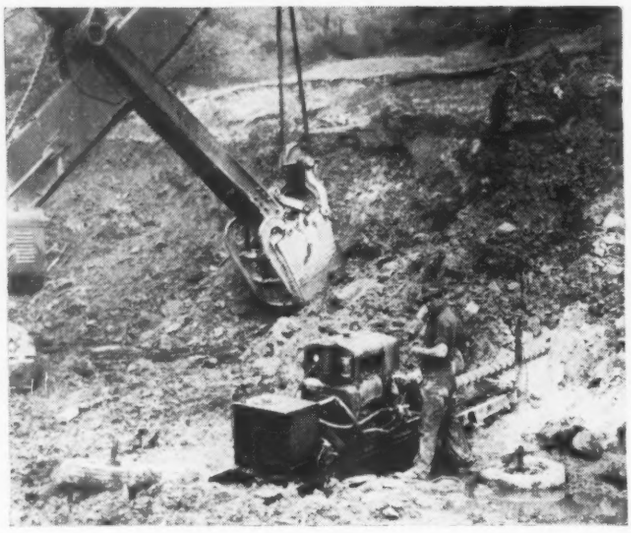
TUBULAR FRAME features the newest-type rock wagon.



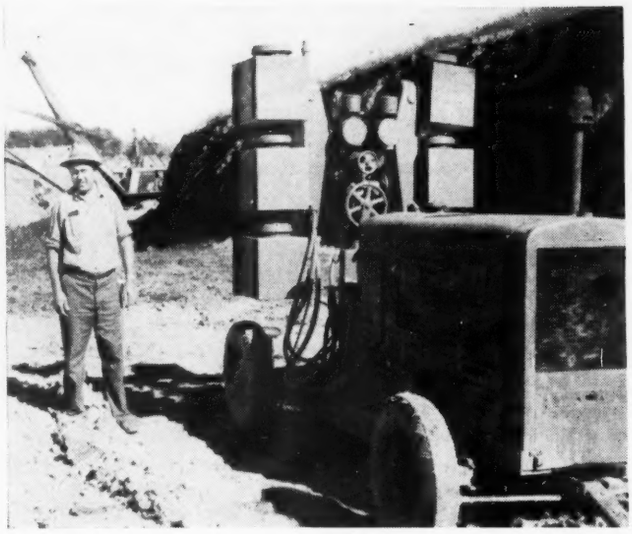
COMPLETED PIT where the highwall height is 55 ft. Final Pittsburgh cut has been loaded out. The Redstone is about halfway up the wall.

STRIPPING AND LOADING the Redstone seam resulted in the bench at the upper right. The shovel in the background is loading the Pittsburgh.

Varied Equipment Works in the Pit

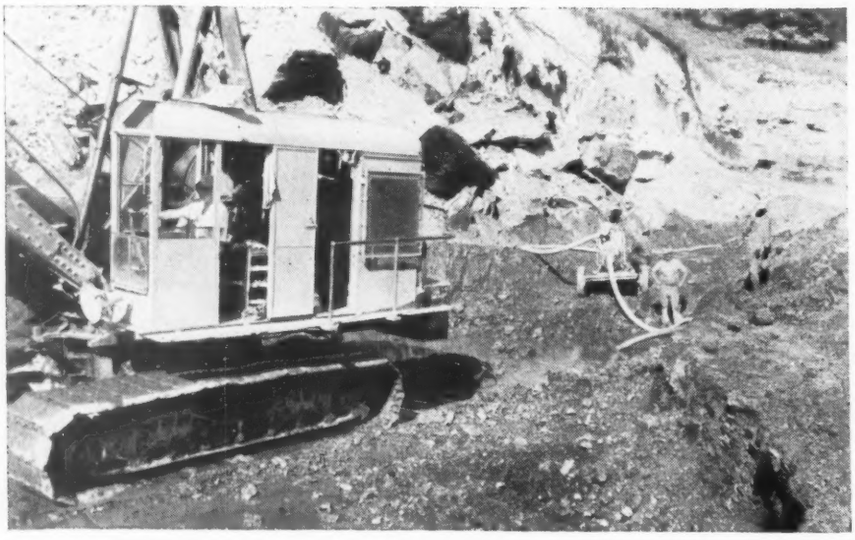


DRILLING PITTSBURGH OVERBURDEN back of a 2½-yd. shovel. Sidewall drilling ranges up to 100 ft. in depth.



SIX-LAMP army-surplus lighting unit provides wide range of beam adjustment.

LOADING 20-TON TRUCK with 2-yd. shovel. Usual two-, three- and four-shovel loading was not being done this particular day.



A SUMP HAS BEEN DUG by the operator of the loading shovel back of him and the pitmen have moved a dewatering pump to the scene.

loading the entire 135- to 150-ft. width of coal.

Larger capacity and speedier dumping were the objects in developing side-dumping rubber-tired wagons to augment or replace the crawler-type wagons pulled by tractors formerly handling the entire rock-haulage job. As a result of initial success with the first rubber-tired wagon built with a conventional I-beam frame, four more were built, but with a single tubular frame.

Power units purchased through the Rish Equipment Co. to pull these 27-yd. 40-ton semi-trailers are Type 9LDT tractors made by the Euclid Road Machinery Co. The tractors are driven by a 275-hp. Cummins supercharged diesel engine. Building of the 27-yd. semi-trailers was done by the Grafton Coal Co. under the supervision of M. W. Drummond, mechanical superintendent.

Tires on the semi-trailers and on the rears of the tractors are 30x33 Firestone. Wheel gages, measured as total width outside the tires, are 12 ft. for the trailer and 10 ft. for the rear end of the tractor. The wagon or semi-trailer, which sometimes is loaded to 45 tons, is twice the size of any others of its type, according to information in the hands of the coal-company management. Tare weight of the wagon and power unit is 30 tons.

After the wagon has been loaded and starts its round trip it moves at approximately 8 m.p.h., which is second gear, and dumps over the hillside without slowing down. Ten dipperfuls of rock from a 2½-yd. shovel constitute the usual load.

Shotholes in 5- and 6-in. diame-

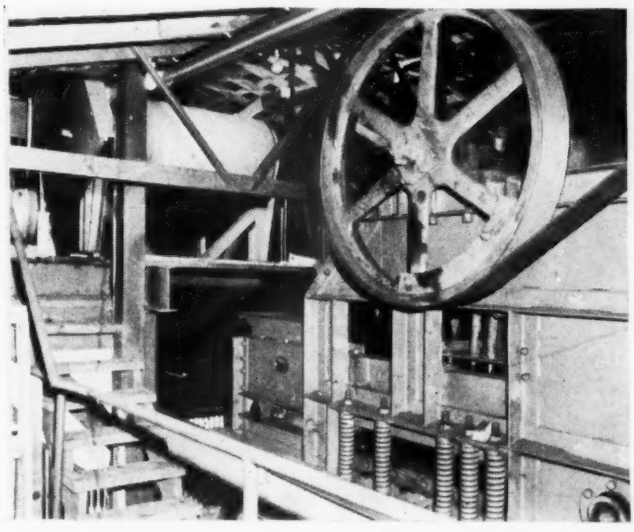
Trenching, Haulage and Preparation

TRENCH 15 ft. wide and 5 ft. deep around hillside catches rocks that otherwise would roll down on farm land.

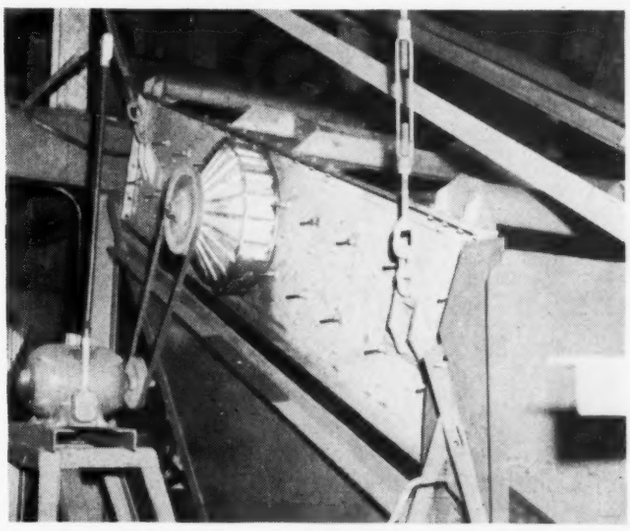
SURFACED ROAD (left) is for loads. The steeper unsurfaced short cut (right) is used by empty trucks in dry weather.

DUMPING COAL to the hillside hopper at the preparation plant. The two trucks at the left haul 20 tons each.

PICKING on the apron conveyor in the tipple. The rubber belt at the right is part of the second unit in this two-sided plant.

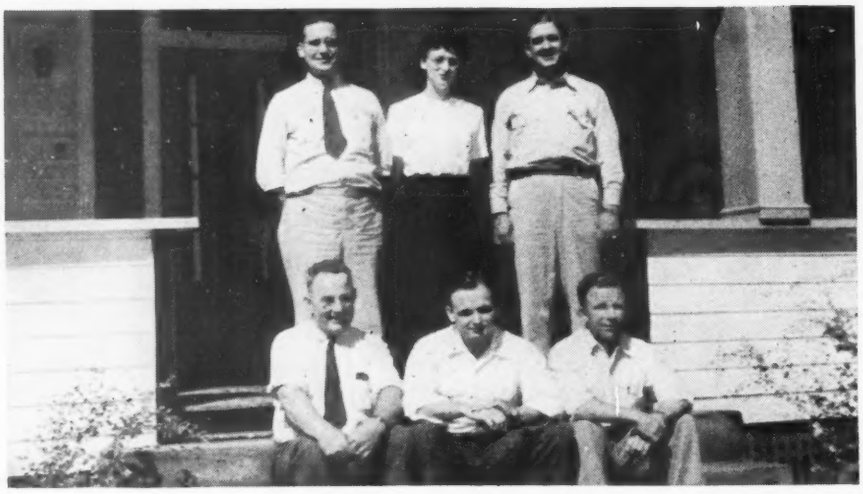


PICK BREAKER (right) receives all coal from the 60-in. elevating and picking belt (head pulley at upper left).



CRUSHED COAL IS SIZED on two 4x10-ft. double-deck vibrating screens set side by side and operating in parallel.

Coal Hustlers at Grafton



R. L. Satterfield (standing, left), vice president; Virginia Hawkins, office manager; and Charles E. Compton, owner and president; seated, J. W. Greaves, real-estate agent; Ralph White, billing clerk; and D. H. Pepper, cost clerk.

F. P. Young (standing, left), stock-room foreman; Burt Ice, truck foreman; J. W. Greaves, real-estate agent; Orville Boggess, tipple foreman; C. A. Lipscomb, tipple yard foreman; and Dan E. Avery; kneeling, M. W. Drummond (left), mechanical superintendent; J. P. Franz, shipping clerk; E. R. Stirewalt, master mechanic; William McQuaid, stock-room clerk; and R. L. Satterfield, vice president.

ters, drilled on 15-ft. centers, starting 3 ft. above the coal, are inclined slightly to bed the explosive 3 to 8 ft. above the top of the seam. Kennametal bits are used—the finger type in semi-sandstone and the solid-head type in softer materials. Blocks of overburden shot at one time range from 50 to 150 ft. wide and 300 to 400 ft. long.

American Cyanamid explosives are used—40- and 60-percent strengths. Dry holes are shot with ammonia-base dynamite and wet holes with Quarry Gel. One hundred pounds of 60-percent is loaded around the detonator in shooting with Quarry Gel and 350 lb. with ammonia-base powder. Long holes are deck-loaded, the spacing being 5 to 10 ft., and in some instances these spaces are filled with tamping. At the collar of the hole, 15 ft. of tamping is standard.

In the winter of 1946-7 the average use of explosives per day was 10,000 lb. and on one day 10,700 lb. was loaded. One shot of 35,000 lb. was fired and two of 21,000 lb. each.

At Pepper Mine, with the equipment now in use, it is not considered good practice to strip beyond a 60-ft. cover line when the seam is less than 7 ft. thick.

When following stripping Method 1, it is important that the 35-ft.-wide pit from which the first cut of coal has been loaded be bulldozed full to the top of the coal so that shooting the overburden will not drive the coal out sideways. As much as 10 ft. of coal can be lost by leaving an open front.

The recently amended West Virginia strip-mining law, which increased the bond to $500 per acre and thus makes it economically necessary to level the spoil, enters very little into the methods followed by

Gale Anderson (left), pit foreman; R. J. Sinclair, drill and powder foreman; and Russell Lamb, strip foreman.

Jess Anderson (left), pit foreman; C. C. Weekley, night superintendent; and L. W. Weekley, superintendent.

the Grafton Coal Co. Working 2- and 2½-yd. shovels in the most efficient way, that is, hauling most of the rock away from them in wagons so there is no rehandling, results in making it economical to do deeper stripping and, finally, requires only a small amount of work with a bulldozer to complete the leveling and cover the Pittsburgh-seam rib.

To protect good farm land lying below the expected lower limit of the spoil bank, a trench 15 ft. wide and 5 ft. deep is bulldozed around the hillside. Rolling rocks are trapped by this trench.

All coal is hauled on top of the seam. The bottom is rough and wet. To maintain dry pits and thus load dry coal which will screen readily, the loading shovels dig out sumps behind them to drain water, which is pumped by portable gasoline units. This water is discharged close by on the hillside if it will do no damage. Otherwise, it is piped to an abandoned pit or to an advantageous discharge point.

Keeping coal trucks on top of the coal seam also avoids swinging the loading shovels 180 deg. and makes it possible to use two, three or four shovels abreast. Using three abreast in a pit is common practice and four is not unusual.

Where three shovels work abreast in a pit, with two trucks parked in loading position on the coal, the center shovel can load into either trucks as a result of the operator watching his opportunities to empty the dipper each time in the truck not receiving coal from another shovel at that moment. Delays to trucks are cut to a minimum and there is a healthy competition between operators. In addition to the company-owned trucks listed previously, a number of hired trucks are employed in hauling the coal.

The coal normally must be shot. It is drilled with Hardsoeg gasoline-driven vertical drills and shot with American Cyanamid pellet.

Primary surfacing of graded roads consists of soapstone from the pit packed to a depth of 2 ft. The soapstone slacks and forms a seal against water. Over it, 4 in. of slag-base crushed stone is spread as a wearing surface. An unsurfaced steeper-grade road is used as a short-cut during dry weather by the empty trucks coming downhill from a ridge that must be crossed in hauling to the tipple. To date, the company has built 10 miles of wide-surfaced road.

Trucks end-dump on a hillside into a 600-ton bin or hopper through which the coal gravitates down to the tipple feeders. Four trucks can dump at the same time but seldom do more than two arrive together. Top width of the bin and of the dumping platform is 40 ft. At the bottcm, the bin width is 20 ft. and the slope is approximately 45 deg.

Privately owned spur railroad track and sidings serving the new tipple total 3½ miles. Trackage above the tipple accommodates 120 railroad cars. The tipple is an all-steel structure 40 ft. wide, 150 ft. long and covered with 27-gage aluminum. It contains duplicate equipment; that is, coal-handling and preparation takes place in two parallel streams. If a unit in one stream breaks down, the other can continue to deliver a large tonnage.

The necessity for speed in getting the tipple into production was another reason for it being built in duplicate. One temporary side was utilized while construction of the other in a permanent manner was going on. Each side has a capacity of 600 t.p.h.

In the operation of one side, or stream, a 600-t.p.h. variable-stroke 42-in.x9-ft. feeder delivers to a 13½-deg. inclined belt conveyor, 60 in. wide and 65 ft. long (c.-c.) with Manhattan belting operating on Timken-bearing idlers made by the Continental Gin Co. Picking of the mine-run is done on this conveyor. A drag conveyor and rubber belt carry the refuse to a storage bin, from which trucks haul it to disposal areas.

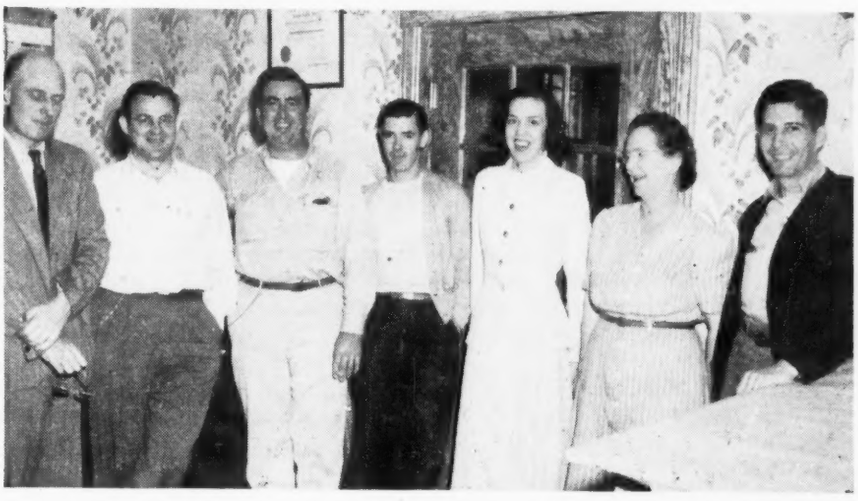
The 60-in. belt delivers to a 600-t.p.h. McNally-Pittsburg pick breaker. The crushed coal is elevated by a 48-in. belt to a pair of 4x10-ft. double-deck vibrating screens, made by the Productive Equipment Corp. and operating in parallel. Cross conveyors deliver to the tracks. Loading booms will be installed on the lump and egg tracks.

Electrical Controls Grouped

The connected load of the tipple is 275 hp. Motors are 220-volt a.c. and most of them are new, made principally by Westinghouse. Grouped on one control board are 26 Westinghouse Deion line starters and circuit breakers. The electrical layout and installation were handled by Barnes & Brass Electric Co., Clarksburg.

The payroll of Pepper Mine of the Grafton Coal Co. comprises approximately 300 employees. Production in 1947 was 1,004,000 tons.

Officials and management employees are: L. W. Weekley, superintendent; Lynn L. Allen, chief engineer; Jesse Anderson and Russell Lamp, strip foremen; G. R. Anderson, pit foreman; C. C. Weekley, night superintendent; R. J. Sinclair, drill and powder foreman; J. W. Greaves, real-estate agent; E. R. Stirewalt, master mechanic; M. W. Drummond, mechanical superintendent; W. J. Higginbotham, welding foreman; Lawrence Lemon, mechanical foreman; Bert Ice, truck foreman; Orville Boggess, tipple foreman; C. A. Lipscomb, tipple-yard foreman; Fred Ashcraft, foreman; A. F. Sandy Jr., purchasing agent; D. H. Pepper, cost clerk; Virginia Hawkins, office manager; Harold Fidler, payroll clerk; Ralph White, billing clerk; P. H. Partridge, bookkeeper; Gayle Manning, clerk; J. P. Franz, shipping clerk; Mildred Stydahar, stenographer; F. P. Young, stockroom foreman; K. R. Curry, shop foreman; and Fred Dusenberry, weighmaster.



P. H. Partridge (left), bookkeeper; Harold Fidler, payroll clerk; L. W. Weekley, superintendent; Gayle Manning, clerk; Mildred Stydahar, stenographer; Mrs. Rossie Hyman; and A. F. Sandy Jr., purchasing agent.

SECTION OF THE NEW outside haulway to bring Anthras coal to the Blue Rose plant and eliminate the old aerial tram and tipple.

Haulage Helps at New Jellico

Cuts Up to 900 Ft. Long and 32 Ft. Deep Reduce Haulage Grades—Mechanical Loading Cuts Cost of Grading—New Outside Haul, Made With Bulldozer, Eliminates Old Tipple and Aerial Tramway

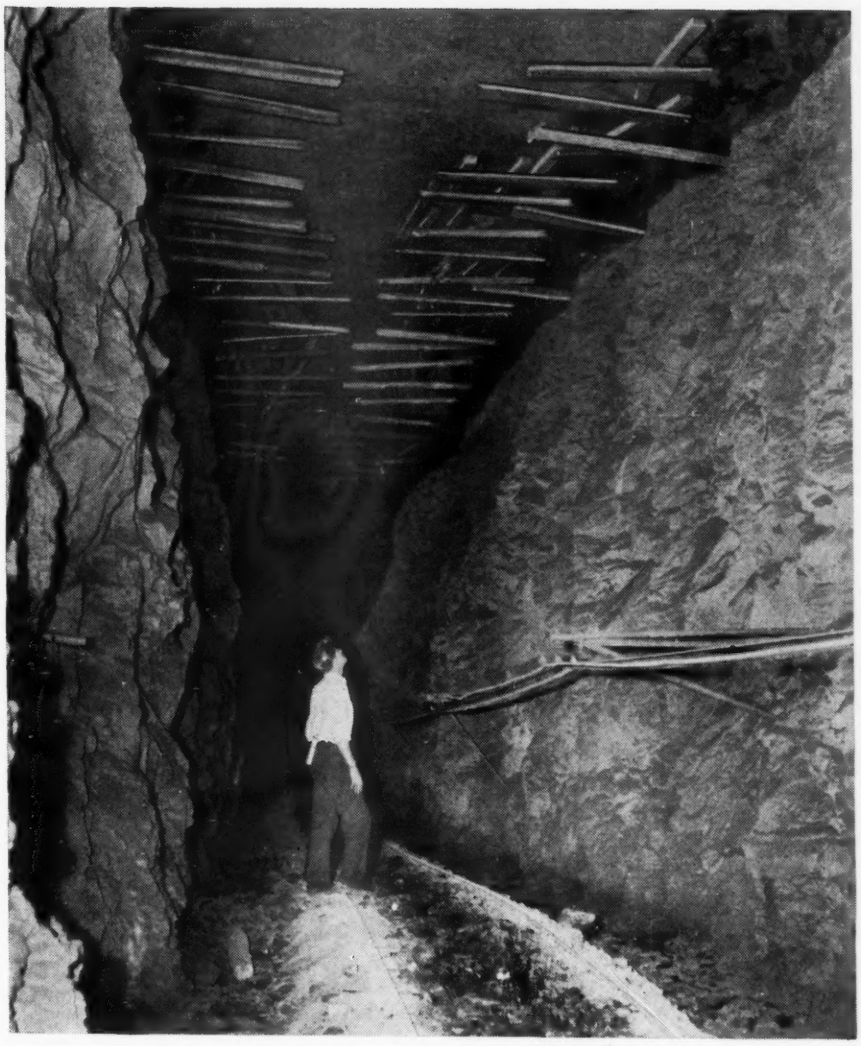
HAULAGE IMPROVEMENTS made in the past year or so, or now underway, at operations of the New Jellico Coal Co., Morley, Tenn., include two cuts 900 and 780 ft. long to reduce grade in new working areas, and a new outside haulway to bring coal from the company's Anthras mine to the Blue Rose preparation plant. The new outside haul will eliminate the old Anthras tipple and the original aerial tramway of over a mile in length, which carried the coal from the portal over a deep valley and across a hill to the plant. Since the capacity of the tram was limited to 600 tons per shift, the change will permit a substantial increase in production from the Anthras workings if desirable in the future.

The two rock cuts previously referred to were a necessary step in opening up new Blue Rose and Anthras territory to the east of the old Morley mine. The seam being recovered is the Jellico, some 33 to 38 in. in thickness and dipping very slightly to the east. The seam is very rolling, however, in addition to a tendency to thicken, thin or even pinch completely out at times. Because of its rolling nature, sharp grades either in favor of or against the loads can be encountered at any time. Such was the case in developing the Blue Rose and new Anthras acreage lying between the old Morley mine and the Anthras operation to the east.

Big hills were encountered in driving new mains into both the new working sections. Since the maximum grade against the loads would have been 10 percent in both cases, it was necessary to cut the hills down if the coal was to be mined, since there was no other practicable way to get at it. Expected production from the Anthras entry is approximately 250,000 tons; from the Blue Rose entry, 1½ million tons. Cost of grading the Anthras haulway was $17,000 in labor; Blue Rose haulway, $24,000 in labor.

The project was handled by the mine force under the direction of Fred T. Loving Jr., general manager, and other engineering and operating officials, including C. J. Barton, assistant general manager; Lester Chitwood, superintendent, Blue Rose; C. M. Benge, superintendent, Anthras mine; John Elliott, mining engineer; B. H. Elliott, assistant mining engineer. In addition to the above, W. D. Perkins is general mine foreman at Blue Rose and John Reeves at Anthras. Otha Adkins and Aught Tippett are preparation foremen.

Before starting rock work, the entries were driven across the hills with chain conveyors. Preparations then were made for cutting the hills down in the haulage headings to a maximum of 2½ percent against the loads. Equipment included a Whaley No. 3 Automat loading machine purchased for gen-



PART OF THE CUT in the bottom in the new Anthras haulway to reduce grade against the loads from 10 to 2½ percent.

eral rock work, Cantrell portable air compressors, 35-lb. Ingersoll-Rand Jackhamers, 6-ton General Electric locomotives and the necessary mine cars. Since the Anthras top is hard, very little timbering was necessary before rock work was started. In the Blue Rose entry, however, top conditions were not quite so good and consequently steel crossbars were installed in spots.

The hills were cut down by slicing them off in lifts 5 ft. deep, starting on the top in each case. Drilling and loading were done on two shifts and shooting on the third. Crews on the two loading shifts consisted of a motorman, coupler, loader operator and two drillers. On the third shift, two men loaded the holes, drilled on 4-ft. centers, with Gelobel and shot them. In loading, the 6-ton locomotive pushed a car up to the Whaley and then pulled it back down grade, switched it into a crosscut, picked up an empty and trammed back to the machine.

Maximum production was 55 cars of 4 tons or more of rock per shift. Maximum depth of cut in the Anthras haulway was 26 ft.; in the Blue Rose haulway, 32 ft. Anthras was the first and required over 90 days to complete. Experience in the Anthras cut permitted finishing the deeper and longer Blue Rose cut in somewhat less time—about 90 days. Width of the Anthras cut was approximately 13 ft.; Blue Rose, approximately 12 ft. The track was torn up and relaid for each lift, and part of the Blue Rose cut—on the inby side—was handled with a Goodman shaker conveyor, the rock cars being pulled out over the hill on temporary track laid in the aircourse in the coal seam.

Still in the process of being completed, the Anthras changeover, in addition to new cars, involves changing the track gage from 40 to 42 in. to correspond with that at Blue Rose and new Anthras, and construction of 3,280 ft. of outside tramway (now completed at a cost of $20,000, including labor and materials).

Grading for the outside haul was done with an International Harvester TD-14 tractor and bulldozer. The bulldozer first cleaned off the dirt down to solid rock, which was then shot and dozed off in turn to complete the grade. Grading, laying track and hanging wire on steel supports fabricated in the mine shop required some four months' time. Maximum height of cut in the side of the hill was approximately 20 ft. Track consists of 60-lb. rail with bonded splice-bar joints laid on 5x7 ties.

Old Cars Being Replaced

Present car equipment at Blue Rose and new Anthras consists of Sanford-Day and ACF steel rotary dump units (Timken bearings) with a capacity of a little over 2 tons each. The cars have been in service a number of years and to reduce maintenance and spillage, as well as make the operation run smoother, they are being progressively replaced with new units of the same general type. The new equipment also will replace the end-dump cars used in the older Anthras workings.

With the completion of the Anthras changeover, the hauls from the respective workings will be 3½ miles from old Anthras, and three miles lengthening eventually to more than four miles from new Anthras and Blue Rose. Grades against the loads will vary up to 4 percent and all the coal will be pulled through a haulway in the old Morley mine to the dump on the hill above the Blue Rose preparation plant.

Present main-line locomotive equipment consists of one 8- and one 10-ton Jeffrey locomotives, the two together delivering 1,400 tons per shift a little over three miles to the dump. When the old Anthras changeover is made, it is expected that production may be built up from 600 to 1,000 tons per shift. Three 10-ton locomotives then will handle the output of all three territories, pulling 35-car trips. The preparation plant naturally has sufficient capacity to handle the proposed increase and includes washing equipment for maximum product quality and uniformity.

Passing tracks are installed at strategic intervals and to control the movement of trips a dispatcher is employed and Canton block signals will be installed in the near future.

ST. NICHOLAS CENTRAL BREAKER where 12,500 tons of anthracite coal is prepared in seven hours—the production from four mines and three strippings. The briquetting plant (with smokestack) was erected about 25 months ago.

Preparation at St. Nicholas

Water Clarification and Steady Feed Raise Breaker Capacity—Cones, Hydrotators and Step-Crushing Promote Maintenance of Rigid Specifications—38 Million Tons Carried on Raw-Coal Belt in Seven Years

By OTTO P. SWARTZ

Superintendent, St. Nicholas Central Breaker
The Philadelphia & Reading Coal & Iron Co.

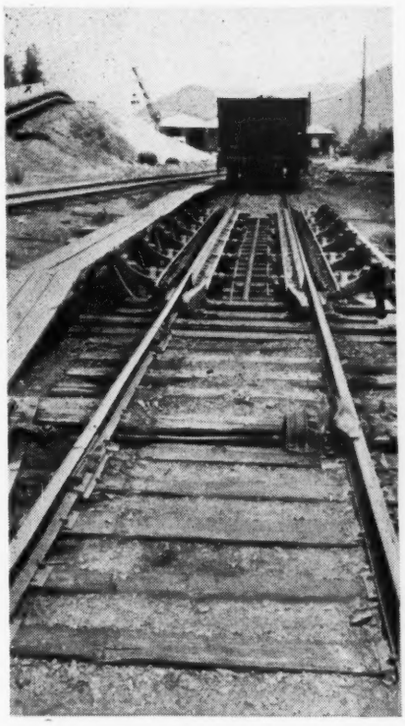
And R. R. RICHART

Associate Editor, Coal Age

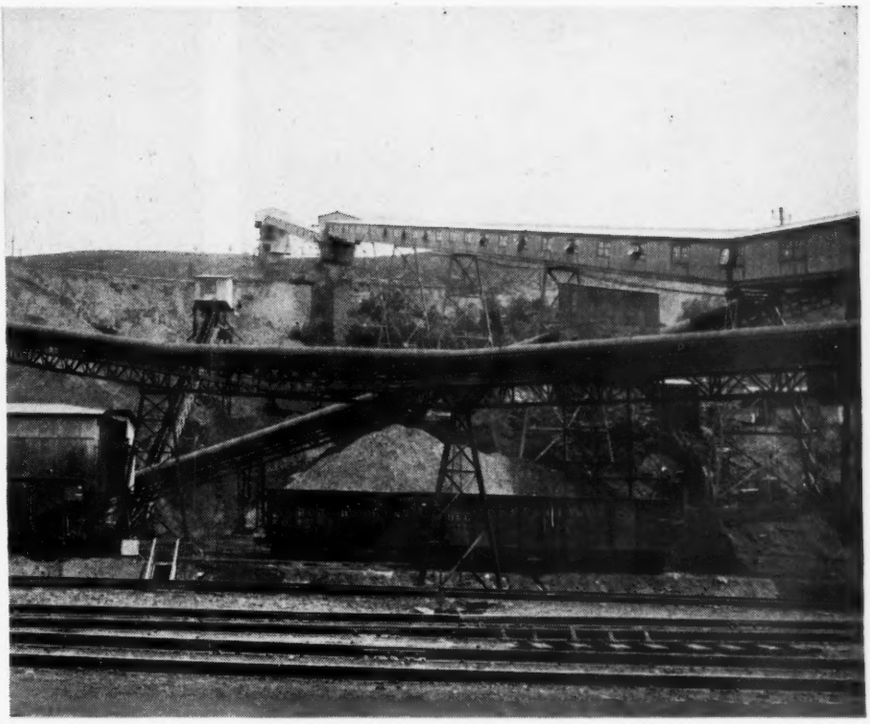
AN EFFICIENT water clarification system plus precision control of the breaker's raw-coal feed and sand-water cones in the two-course flow circuit insures a quality product at The Philadelphia & Reading Coal & Iron Co.'s St. Nicholas Central Breaker, St. Nicholas, Schuylkill County, Pa. Slight changes made in the flow circuit and the speeding-up of the shakers and conveyors have increased the breaker's hourly raw-coal capacity from 1,625 net tons, as designed by Stone & Webster Engineering Corp. in 1932, to 3,000. The seven-hour output of the plant is about 12,500 tons of prepared "Reading" anthracite, and approximately 6,100 tons of solid refuse—the yield from the raw-coal feed being about 54 percent.

The raw-coal feed to St. Nicholas consists of the rough-cleaned 6-in. product from eight primary cleaning plants handling the production from four mines and three strippings. The Maple Hill primary cleaning plant (Fig. 1), located nearby, rough cleans the coal delivered to it in mine cars from the Maple Hill and Knickerbocker collieries, and also that conveyed by belt from the Suffolk ramp where strip coal from the new Shenn-Penn operation is dumped from trucks.

During the day shift, the rough-cleaned coal from the Maple Hill cleaner plant is carried on three separate 60-in. belts before it reaches the St. Nicholas breaker. The first belt terminates at the transfer house where the coal is either transferred to a second belt or, in the case of the second-shift operation, is loaded into railroad cars for storage. The second belt conveyor (1,007 ft. long, 475 f.p.m.) conveys the coal to another belt-transfer station underneath the railroad-car rotary-dump station. Here, a third or main belt conveyor (828 ft. long, 550 f.p.m.) transports the coal from the No. 2 belt and the rotary dump's two rotating feeders to the top of the St. Nicholas breaker at a rate of 3,000 t.p.h. A Weightometer on the main belt enables the rotary-dump station attendant to maintain the 3,000-t.p.h. flow rate through the regulation of the rotating feeders. Selsyn indicators (small positioning-type self-synchronous motors) keyed to dial pointers indicate the raw-coal feed rate, in tons per hour, at the rotary-dump station and at the control panels for the primary and secondary cones in the breaker. The feed also is recorded on a chart in the main office.



THE AIR-OPERATED car retarder and derail are interlocked with the rotary dump.



HOW CONVEYORS CROSS one another in the yard at St. Nicholas. The two-section conveyor on the right handles all the solid refuse from the breaker.

The coal shipped from outlying operations to St. Nicholas by railroad cars is stored in the six-track raw-coal yard, shown in Fig. 1. During freezing weather, the cars are thawed in a six-track, 18-car thaw shed where air, after passing over steam-heated coils, is released from track manholes located underneath the cars. If the cars are dumped at the usual rate—25 per hour—a car remains in the thaw shed about 43 minutes. Cars are weighed on the way to the rotary dump, and again after the coal has been dumped and the car has been washed. The light-car weights are used in billing the car after it has been loaded for market.

The simplified flow sheet (Fig. 3), except for the No. 4 and No. 5 buckwheat preparation equipment, only shows half the equipment in the breaker. The flow of coal, as shown, is divided into three major circuits: (1) the larger sizes, which range from broken to nut; (2) the smaller sizes, which include those from pea to barley; and (3) the very fine sizes or the No. 4 and No. 5 buckwheat. Once the raw-coal feed is split for the east-and-west circuits, the three major circuits referred to originate at the No. 1 scalping screens.

Tracing the circuit for the larger sizes, the minus 6x2 7/16-in. is cleaned in an 18-ft.-diameter primary Chance cone. Hand-picking the plus 6-in. coal and bypassing it

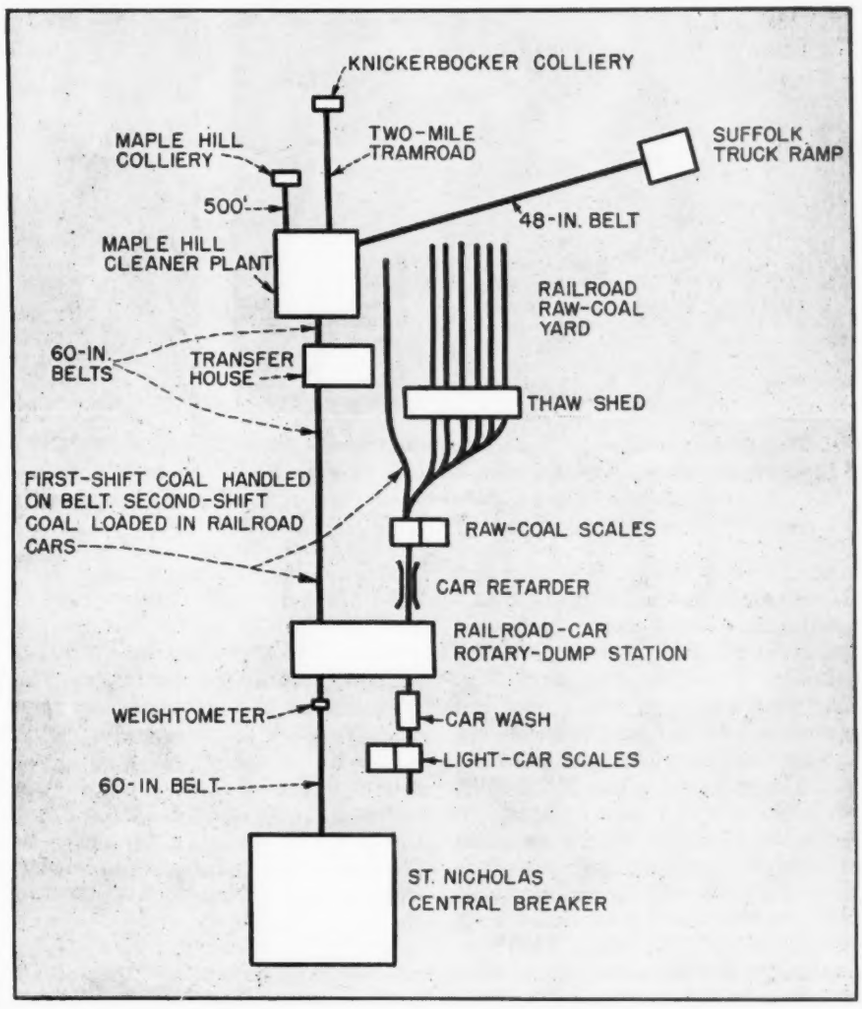
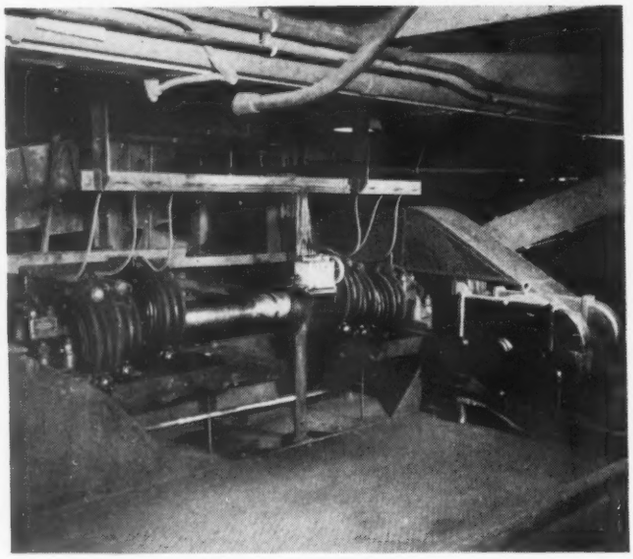
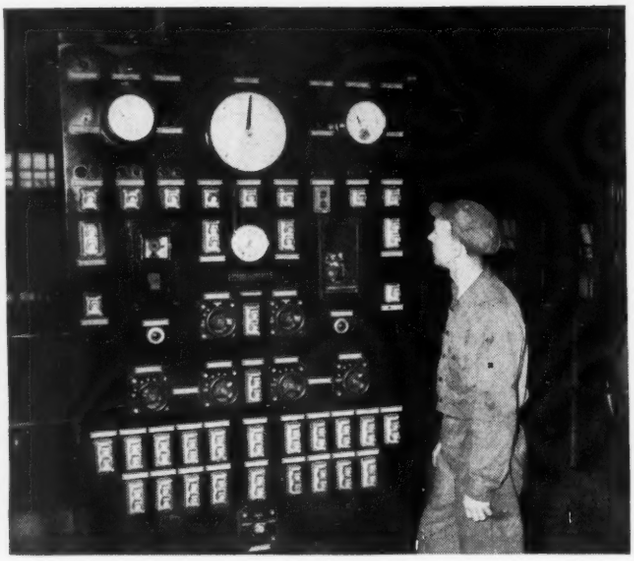


FIG. 1—HOW THE SUPPLY of raw coal is handled before it reaches the St. Nicholas central breaker.

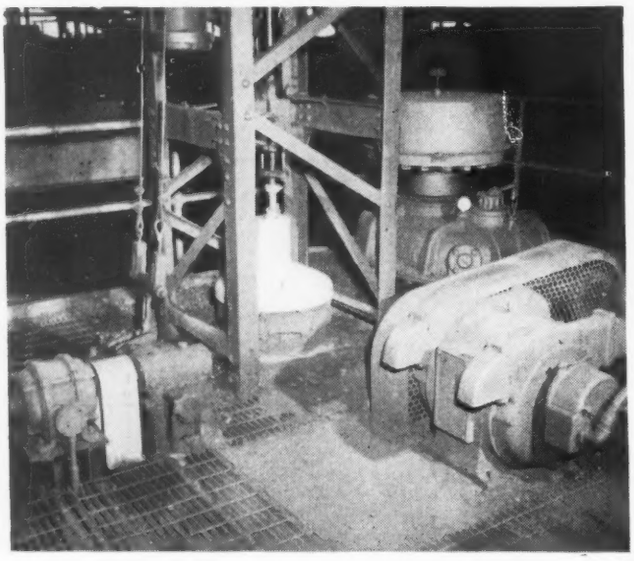
Controls Guard Every Step at St. Nicholas



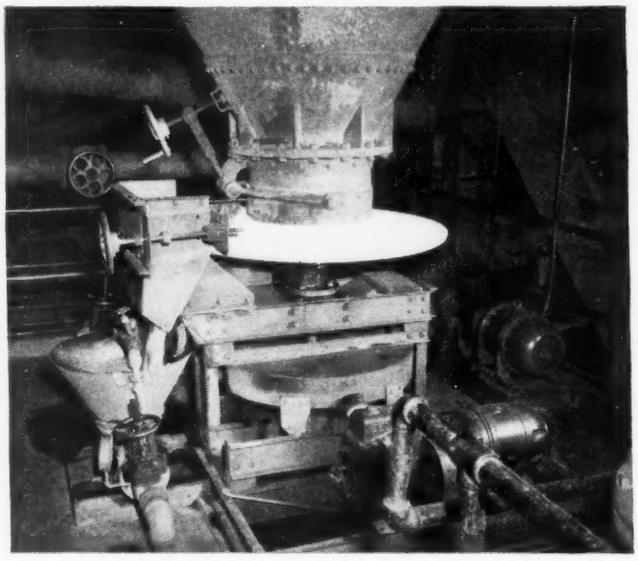
A FORCE-FEED LUBRICATOR oils the eccentrics on the drive for the No. 1 scalping screens. Lubricants wisely applied improve machinery performance and reduce repairs.



JOE MATHEWS, CONE OPERATOR (for the primary cones in both the east and west circuits), notices that according to the large dial the raw-coal feed rate has dropped.



THE DETECTOR (center) on the pea and buckwheat cone facilitates the trapping out of the refuse. The refuse also may be trapped-out manually or by time-cycle operation.



THE SAND INDUCTOR MACHINE supplies sand to ten cones in the St. Nicholas breaker. High-gravity 30- to 80-mesh Jersey shore sand is used exclusively. Cone gravities range from 1.72 to 1.80.

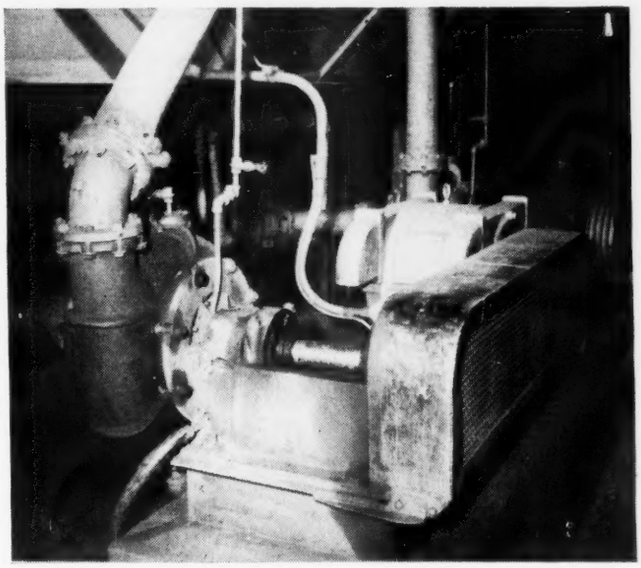
around the primary cone was one change made in the flow sheet which greatly increased the capacity of the breaker. The product from the primary cone and the plus 6-in. coal pass over the No. 2 scalping screens where the sand is recovered and the coal is cut in two sizes. The plus 4⅜-in. is fed to the No. 2 rolls, while the minus 4⅜-in. is bypassed —the two circuits converging again at the No. 3 scalping screens. Further crushing and sizing may take place at the No. 3 and No. 4 rolls before all of the plus 13/16-in. finally is fed into an 18-ft. secondary cone. The product from this cone is sized and washed with clean water before being loaded.

As an experiment, a New Holland Model 2020 limestone-type rock crusher is being installed to reclaim coal from the plus 2 7/16-in. cappy-laminated material in the refuse from the secondary cone.

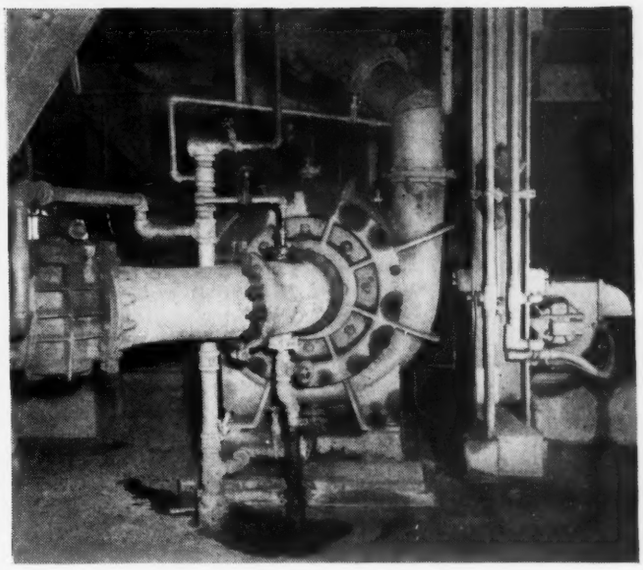
Going back to the starting point —the No. 1 scalping screens—the minus 13/16x5/16-in., and the minus 5/16x3/32-in. material from the primary desilting screens, are fed onto the primary underflow screens where the separation for the pea-buckwheat (18-ft. cone) and the rice-barley (two 10-ft. cones) cones is made. The minus 3/32-in. material from the screens passes into the underflow hoppers. The products from these Chance cones also are washed with clean water and sized prior to storage in 150-ton bunkers.

In the third circuit originating at the No. 1 scalping screens, the minus 5/16-in. material passes to the primary desilting screens where it is cut at 3/32 in. The plus 3/32-in. material is returned to the No. 2 circuit just described. The minus 3/32-in. material, together with that received from the No. 2 circuit, is sent to two 17-ft.-diameter classifiers (settling cones) where, because of a change of velocity, the heavier particles settle. The lighter particles flow to a Dorr thickener along with the overflow from the classifier.

Sand and Water Reclaimed for Cones



TWO SIX-INCH SAND PUMPS (one spare) driven by 40-hp. motors pump from the 13-ft.-diameter primary refuse sand sump to the 22-ft. diameter No. 2 scalping screen sand sump.



TWO 12-INCH SAND PUMPS (one spare) powered by 75-hp. motors pump from the 22-ft.-diameter sand sump located beneath the secondary cone sizing screens back to the secondary cone.

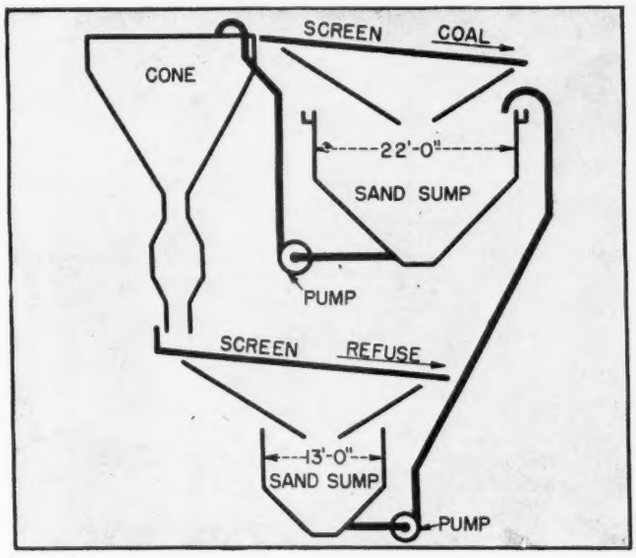
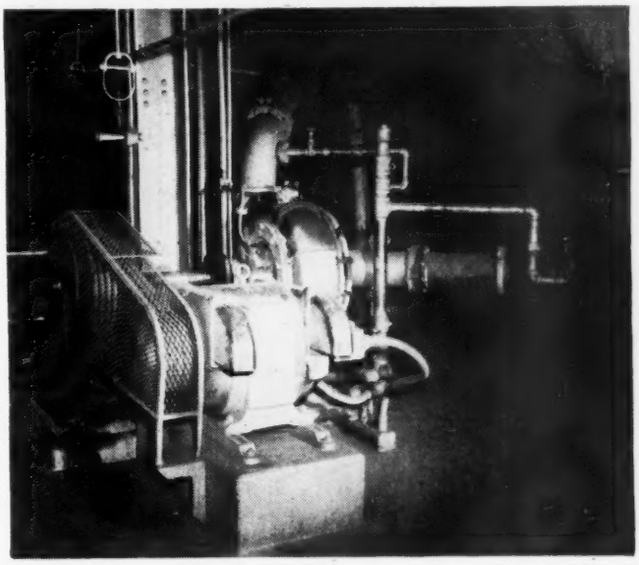


FIG. 2—SIX-, EIGHT- AND 12-INCH centrifugal-type sand pumps assist in returning the sand-and-water to the ten cones in the St. Nicholas breaker.



TWO EIGHT-INCH SAND PUMPS (one spare) pump from the 22-ft.-diameter sand sump, located beneath the pea and buckwheat sizing screens, back to the pea and buckwheat cone.

The material recovered in the classifier is pumped to the No. 4 buckwheat feed screens where it is dewatered and a separation is made at 3/64 in. The plus 3/64-in. is distributed to four No. 4 buckwheat Hydrotators and thence over dewatering screens to a storage bunker.

The minus 3/64-in. feed is passed over a Robins Eliptex vibrating screen equipped with Bixby-Zimmer screen segments where the plus ½-mm. material is recovered and fed to the No. 5 buckwheat Hydrotator. The product from this Hydrotator is passed over a dewatering screen and stored in the bunker with the No. 4 buckwheat. The No. 4 and No. 5 buckwheat is used for boiler plant fuel or conveyed to the briquetting plant (*Coal Age*, October, 1946).

Coal meets water at every turn in the St. Nicholas breaker where Morris pumps circulate a 42,000-gallon-per-minute supply for washing and cleaning the coal. Two 2,800-g.p.m. centrifugal pumps, operating against a 110-ft. head, pump water to the top of the breaker for the initial washing. Water from the initial washing of the raw coal, the fine silt and mud from the overflow of the classifiers, and the fines, mud and refuse from the Hydrotators is returned to the 150-ft.-diameter Dorr thickener. As the solids in the thickener settle, they are raked into the center and flow to a sump. The sump material (30-percent solids) is pumped through 8-in. lines to a sludge dam by three 1,200-g.p.m. two-stage 6-in. pumps (one spare). The discharge lines to the dam are 1,850-ft. long and the pumps work against a 175-ft. head.

The overflow (0.5-percent solids) from the Dorr thickener enters the 50-ft.-diameter slurry tank where it is returned to the breaker. The make-up water (3,200 g.p.m.) is first used on the final sizing screens before it goes to the slurry tank to be used in the large circulating system. The solids in the slurry tank,

How the Coal Moves at St. Nicholas

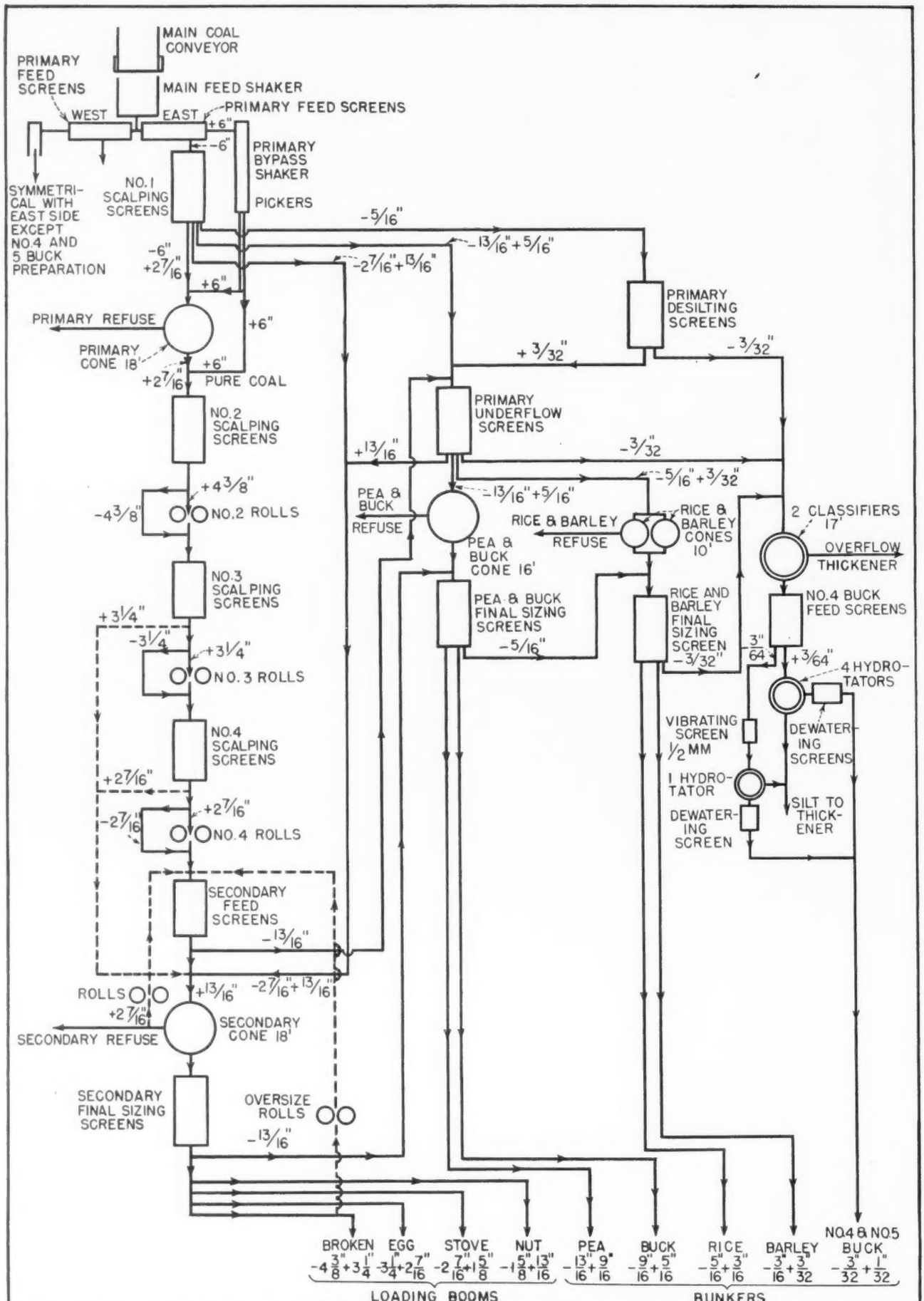
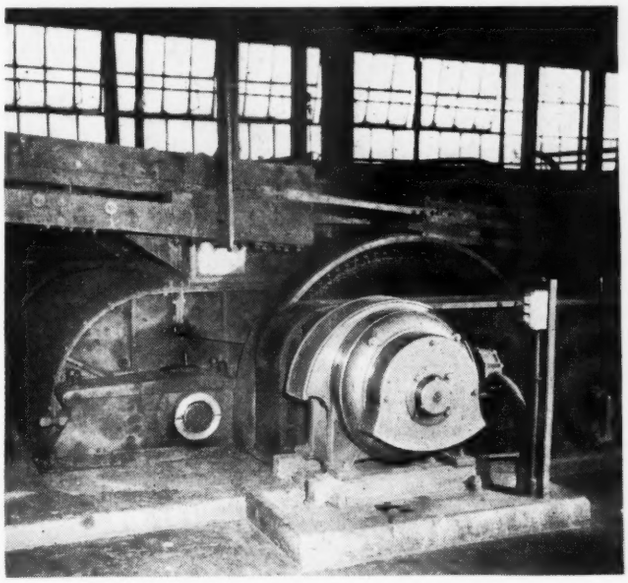
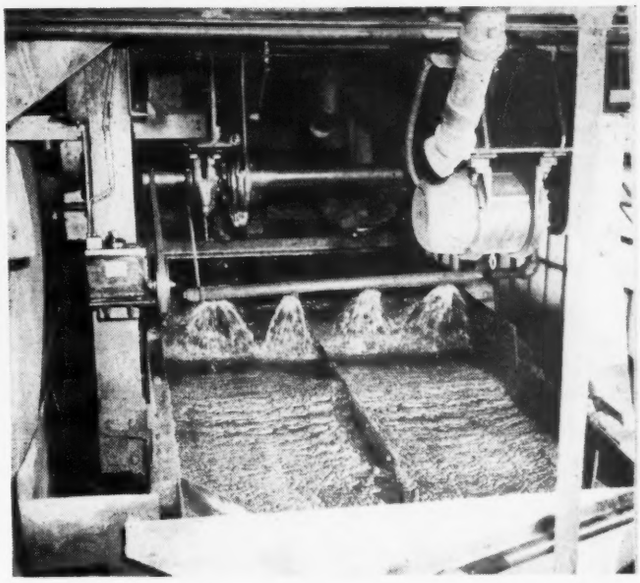


FIG. 3—THIS FLOW SHEET, except for the classifiers and Hydrotators used to prepare the No. 4 and No. 5 buckwheat, shows only one-half of the plant's preparation equipment.

Preparing, Trade-Marking and Inspecting



THE PLUS 4⅜-IN. COAL is crushed here at the No. 2 rolls. Later on, the plus 3¼-in. and 2 7/16-in. sizes are crushed in the No. 3 and No. 4 rolls, respectively.



THE MINUS 3/64x½ mm. PRODUCT from the No. 5 buckwheat Hydrotator as it appears on the dewatering screens prior to being stored in bunkers.

"READING" ANTHRACITE is dotted with red paint by these paint spray units before the coal descends on the loading boom.

COAL INSPECTORS take samples from every car of coal sent to market from the St. Nicholas breaker.

such as the fine sand and silt, flow into the Dorr thickener sump. The overflow from the slurry tank is pumped back to the cones.

One 1,000-g.p.m. high-pressure pump, operating against a 110-ft. head, is used to flush out the lines while starting the breaker. Two 5,900-g.p.m. high-pressure circulating pumps supply water to the top of the breaker for cones, gate water and sprays. Two 11,400-g.p.m. low-pressure circulating pumps, operating against a 75-ft. head, supply water to the pea-buckwheat, rice-barley and secondary cones.

Other pumping facilities include: (1) two 1,000-g.p.m. pumps used intermittently to recover water and fine coal from the car tracks and loading bay; and (2) one 250-g.p.m. pump used for washing the railroad cars after the raw coal has been dumped.

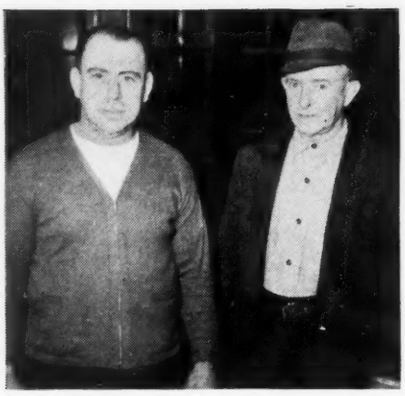
The 3,200-g.p.m. supply of make-up water comes from the mine. The pH reading of the water as it comes from the mine is 5.0 to 5.2. The water is neutralized with lime in a tank before it is pumped by three 2,000-g.p.m. pumps (one spare) to a 300,000-gal. head tank. The make-up water, as already mentioned, is first used in the final washing of the coal before it enters the main circulating system at the slurry tank.

High-gravity 30- to 80-mesh Jersey shore sand is used in the ten Chance cones at St. Nicholas. The cones are operated at the following specific gravities: (1) primary cones—1.80; (2) secondary cones —1.72; and (3) pea-buckwheat, rice-barley cones—1.75.

The sand-pumping circuits for the various cones are illustrated in Fig. 2, and the sand pumps, also Morris, are shown in photos elsewhere in this article. The upper sand sump for each cone is 22 ft. in diameter and the lower sump (sand from the refuse) measures 13 ft. in diameter.

Each 18-ft. primary cone has two 12-in. sand pumps (one spare) that

The Men Who Run St. Nicholas



OPERATING STAFF AT ST. NICHOLAS—Front row, left to right: William Head, breaker foreman; Otto P. Swartz, superintendent; Herbert Wheat, chief electrician; John A. Kline, master mechanic; James J. Furlong, chief clerk; and Evan R. Davis, general foreman. Back row, left to right: C. H. Hagan, yard foreman; A. B. Closser, night repair foreman; John R. Scholes, raw-coal car scale attendant; Wallace Biltz, light-car scale attendant; and S. P. Thurston, preparation foreman. MAPLE HILL CLEANER PLANT (right photo)—J. F. Blickley (right), foreman, and Harold Creasy, weighman.

SHIPPING DEPARTMENT—Front row: James Hugo (left), Harold Richards and Neil Berkheiser. Back row: Allen Draper (left) and D. C. Batdorf, chief shipper.

COAL INSPECTORS—Front row: Joseph Head (left), John Brennan, John Burns and Thomas Corrigan. Back row: Joseph Frew (left), chief, and George Roos.

RETAIL TRADE—Front row: B. S. Griffiths (left), foreman, Elmer Davis, C. N. Shoemaker and Harold Kehler, chief clerk. Back row: James J. Barrett (left), Edward Sanders and Joseph F. Schaaf. SUPPLY ROOM (right photo)—Fred Lehman (right), storekeeper, and Edward Kline, assistant storekeeper.

pump from the 22-ft. sump back to the cone. Two 6-in. sand pumps (one spare) return the refuse sand from the 13-ft. sump up to the 22-ft. sump. This same circuit arrangement is used on the 18-ft. secondary cones, except no spare 6-in. pump is provided for the refuse sand.

The sand-pumping facilities for the pea-buckwheat cones include two 8-in. pumps (one spare) for pumping from the 22-ft. sump to the cone, and one 6-in. pump for returning refuse sand from the 13-ft. to the 22-ft. sump.

Since the rice-barley cones are paired off, one 22-ft. and one 13-ft. sand sump serves both cones. Here, two 6-in. sand pumps pump from the 22-ft. sump back to the cones, and one 6-in. pump returns the refuse sand from the 13-ft. to the 22-ft. sump.

Two men sample the refuse from the Chance cones and report the results of the tests to the cone operators so that any adjustments may be made. The trapping-out of the refuse from the cone is done in either of three ways: (1) by manual operation of the controls; (2) through time-cycle operation; or

(3) by detector bulb. Mercoid switches are used extensively in the trapping-out operations.

More than 6,100 tons of solid refuse are removed from the raw-coal feed in a seven-hour shift at St. Nicholas. The refuse from the primary cones flows by gravity in chutes to a shaking feeder where it is fed onto the main refuse belt. That from the other cones—secondary, pea-buckwheat and rice-barley—is collected on a 182-ft.-long 42-in.-wide gathering belt operating at 520 f.p.m.

The refuse belt system to the refuse-disposal dump consists of two belt conveyors, each driven by a 250-hp. 2,300-volt motor. The original belt, or the first leg of the system, consists of a 48-in.-wide 837-ft.-long 500-f.p.m. belt installed on an average grade of 14 deg. 17 min. It discharges into a 120-ton belt-transfer hopper. The second belt is 48 in. wide, 442 ft. long and travels 500 f.p.m., but operates on somewhat steeper grade—16 deg. 15 min. It discharges the refuse into a 180-ton hopper where it remains until hauled away by larry.

Long Life for Refuse Belts

The average life of the main refuse belt has been seven years, during which time approximately 12 million tons of material were handled. The second section was installed in 1945 and the belt has never been replaced.

Two 85-cu.yd. larry trains haul the refuse from the 180-ton hopper to disposal points on the bank. Each train consists of a 32-cu.yd. two-side-dump motorized locomotive (four 105-hp. motors), a 38-cu.yd. two-way side-dump trailer car and a 15-cu.yd. three-way (end-dump) car. The standard-gage 100-lb.-rail track is installed on a 3-percent grade against the loads.

During 1947, the refuse-disposal system handled 1,630,000 tons. The maximum amount handled in a seven-hour period was 7,100 tons, the average 6,118. Since 1932, approximately 26 million cu.yd. of refuse has been disposed of on the lower level of the bank—an area 4,000 by 1,500 ft. The upper level, which permits increasing the height of the entire bank by 110 ft., will accommodate 20 million cu.yd. within a 4,000-ft. haul, or enough storage space for 12 years.

"Reading" anthracite coal is trade-marked with paint spray guns before it is fed onto the boom belts for loading into railroad cars. The bright red paint dots dry without smearing to leave a positive identification mark on the coal. By actual count, made once a week, 85 percent of the nut coal is marked as it passes the paint guns, and in the larger sizes the percentage of pieces marked is close to 100.

Coal Meets High Standards

Coal prepared at St. Nicholas must meet rigid specifications, and that is why 14 men, assigned to the inspection department, are required for sampling the railroad cars that are loaded for market. David B. Baird, chief coal inspector for P. & R., is in charge of the inspection department, which is supervised by the sales department. Coal prepared during the war years had to meet the same rigid specifications as does today's product.

The weight of the samples ranges from 2½ lb. for No. 4 buckwheat to 100 lb. for the furnace size. A 9-point sample of equal proportions is taken diagonally across the car, at least 2 ft. below the surface and approximately 18 in. from the side of the car.

Tests include sizing for the percent of under and over size. Also, each sample is classified for slate, bone and objectionable material. In the laboratory, the fines are dried, sized, pulverized and burned for ash.

The inspection department also is required to sample the raw coal shipped to St. Nicholas. These yield determinations fix the rates at which the various mines and strippings are paid for the raw product.

Retail trade at St. Nicholas takes the equivalent of 20 railroad cars of fuel on some days. Truckers will drive great distances for well-prepared coal, especially to breakers where their trucks can be loaded and weighed quickly. These conditions are tops at St. Nicholas.

A new retail sales office, with the second set of scales almost ready, will soon serve two lines of trucks over 40-ton, 50-ft.-long Fairbanks-Morse automatic scales. The scale platform is "crowned" for quick run-off and the water is prevented from entering the scale pit. In the winter months the scale pits are to be heated with hot air. A seven-man sales staff makes change and issues certification slips so that there is never much confusion or delay at the retail sales office.

Approximately 192 day-rate and 40 monthly men are employed in and about the St. Nicholas breaker. This group includes the 56-man operating staff, 30 maintenance men, retail and inspection crews, police, and others. Most of the 56 operating men in the breaker proper are assigned to a specific job and station—termed a work sectionalization plan. Each worker is paid in accordance with the highest classification of work performed and he is always to be found near his station in the breaker. This plan helps to improve the worker's efficiency, minimizes breaker delays through a more effective program of preventive maintenance, and keeps the breaker in a more orderly condition.

The fact that there are 30 maintenance men employed indicates that repairs receive immediate attention. Besides the daily and weekly inspection of the equipment, there are the quarterly inspections —where every foot of conveyor is examined and all speed-reducers are opened and examined. Breaker delays are few, simply because there are many inspections of the mechanical equipment made between each delay. Much of the equipment is lubricated through Manzel force-feed lubricators, belted to each unit, and this is partly responsible for the good machinery performance at St. Nicholas.

Sectionalization Reduces Trouble

Electrical troubles are practically nil, due, in part, to the extensive sectionalization of the 440-volt switchgear. There are 13 separate starter rooms, located close to their respective load centers, and every a.c. motor is being supplied with its specified name-plate voltage. Most of the 365 motors (12,000 hp.) are Compton-Parkinson (Canadian), U. S., or Allis-Chalmers.

It is interesting to note the service life obtained from the belts that have been used on the raw-coal conveyor, between the railroad-car rotary-dump station and the top of the breaker. The present belt is the third 9-ply 48-oz. 60-in.-wide belt used on this conveyor. The first one carried 33 million tons during the 6-yr. period from 1932 to 1938. The second belt carried 38 million tons during the 7-yr. period from 1938 to 1945. All belts in service are endless and are vulcanized by the maintenance force.

Safety-first measures are very much in evidence at St. Nicholas. They are particularly essential to a plant like this one where many visitors are permitted. There are 31 2-in. fire-hose stations and 44 fire-extinguisher stations scattered over the plant.

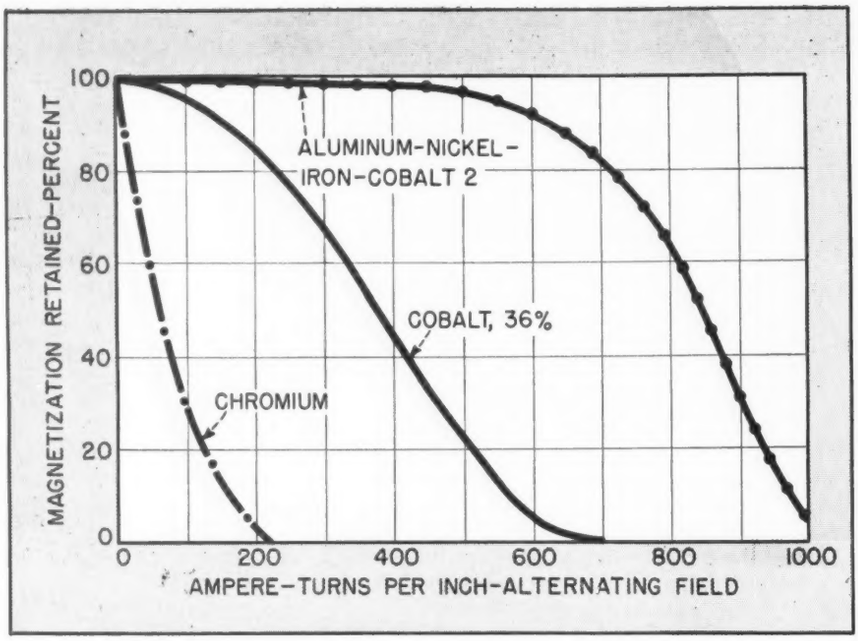


FIG. 1—RESISTANCE of permanent-magnetic materials to stray fields.

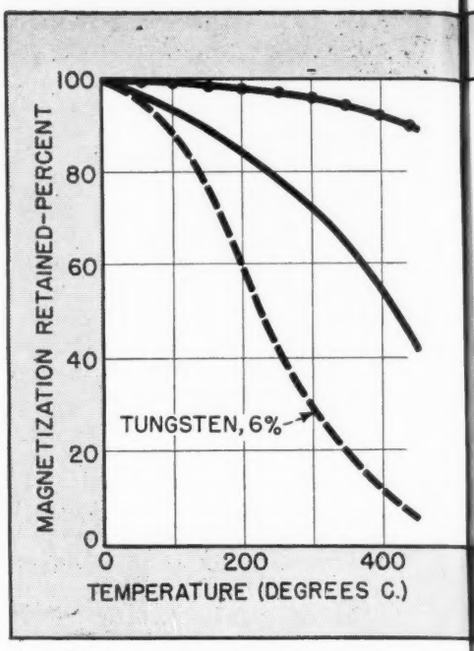


FIG. 2—RELATIVE DECREASE in

Permanent Magnets for Coal

Tramp-Iron Hazards and Losses—Reclamation Possibilities—Permanent Magnetic Materials and Magnets—Design and Application of Plate, Pulley and Drum Units—Underground Applications

By F. E. PARKE
Field Engineer, Eriez Mfg. Co., Erie, Pa.

GREATER USE of mechanized equipment in coal mining is creating a more serious tramp-iron problem. It has been estimated that there is nearly nine times more stray iron in mechanically-loaded coal than in hand-loaded coal. Obviously, the quantity of tramp iron in coal as it comes from the mine varies considerably with local conditions. In some cases we have

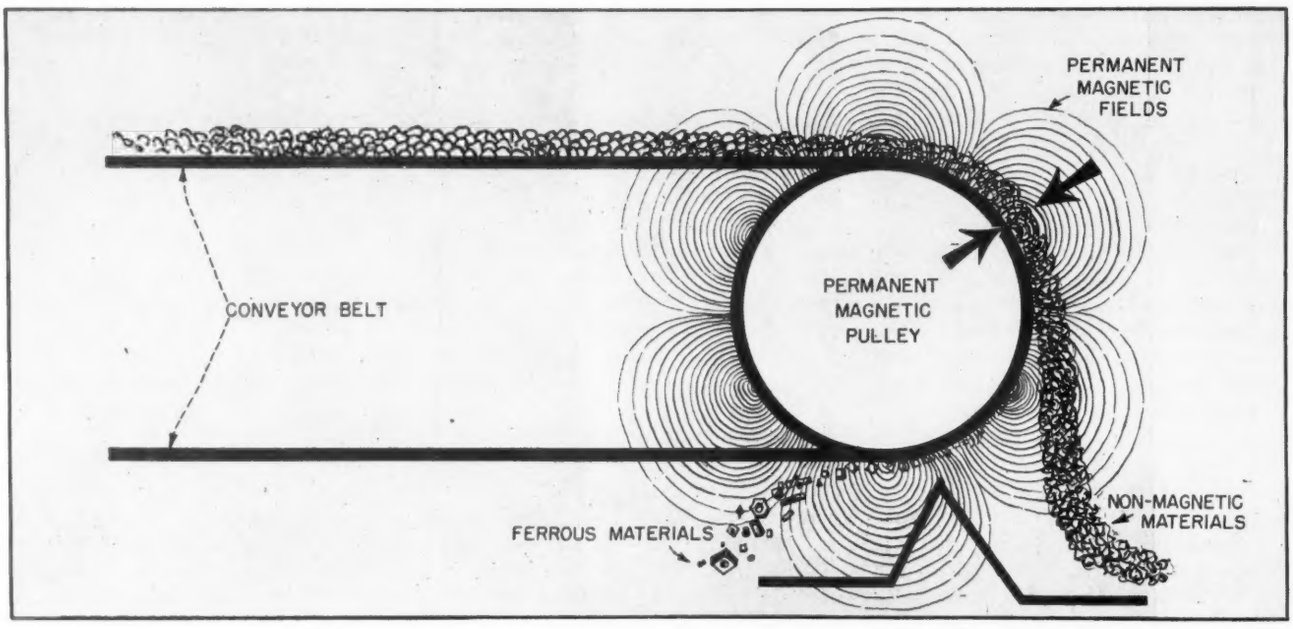
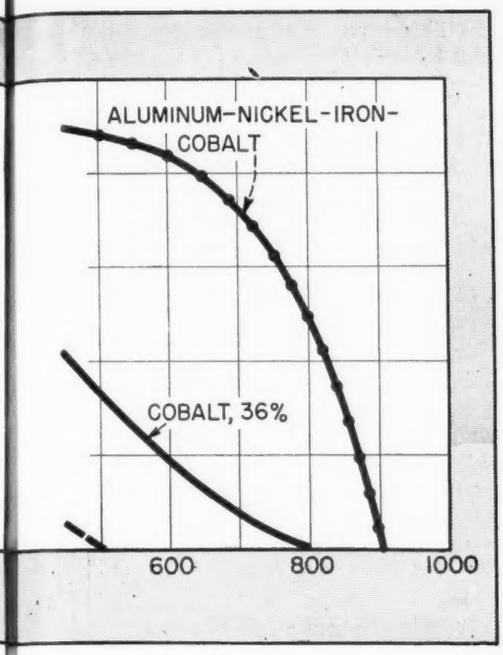


FIG. 4—OPERATION of the permanent-magnetic pulley for tramp-iron separation.



magnetization at varying temperatures.

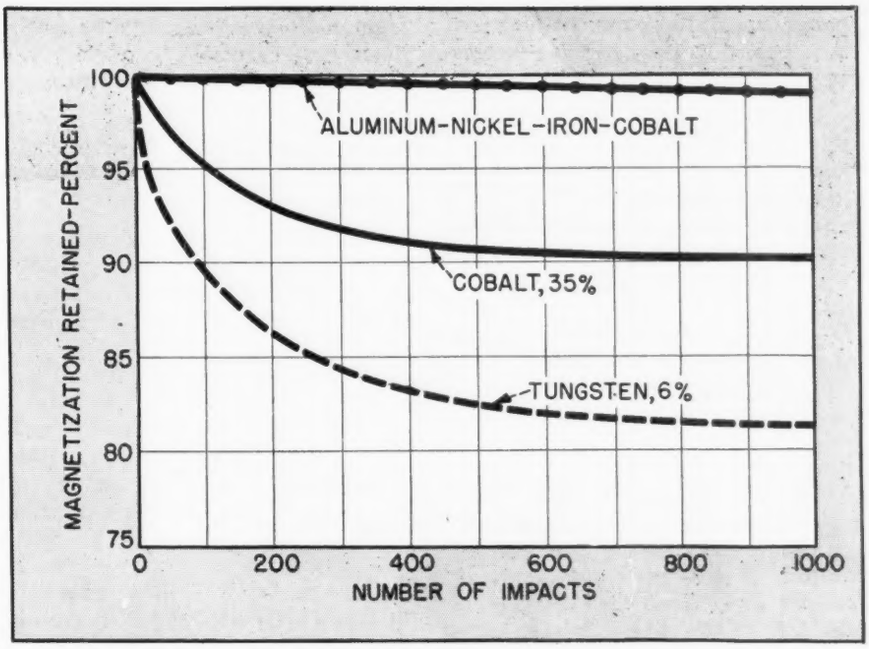


FIG. 3—RESISTANCE of permanent-magnetic materials to impact.

found as much as 1 lb. of iron in each ton of coal. Fortunately this is the exception rather than the rule.

When this tramp iron is removed from the coal, it is found to consist of a varied collection of cutter-bits, rail spikes, nuts, bolts, chain, drill and auger bits, and a multiplicity of other steel parts, any one of which could cause serious damage to processing equipment. There are many records showing that serious damage has resulted from the presence of tramp iron in coal.

The problem may be subdivided as follows:

Damage to Processing Equipment—Processing equipment, such as washers, pulverizers, crushers and stokers, can be seriously damaged by tramp iron. This damage often results in expensive lost-time shutdowns and machinery repair or replacement.

Explosions and Fires—Explosions and fires are a constant threat to personnel and property. In the past, unnecessary loss of life and millions of dollars in property damage can be traced to coal or coke-dust explosions caused by the presence of sparking tramp iron.

Inferior Quality of Product—Customer goodwill can be impaired or lost if coal is inferior in quality. Tramp iron in coal is, of course, only one of the problems in maintaining quality of product. However, tramp iron may cause considerable damage to the customer's processing equipment, certainly resulting in some loss of goodwill and, in some cases, in claims for repairs or costly lawsuits.

Loss of Tools and Scrap Iron—The value of tools and scrap iron lost in coal is much greater than is generally realized. In many cases the reclamation of re-usable parts and scrap will, in a short time, pay for a magnetic separator.

With the development of Alnico, an alloy composed of aluminum, nickel, iron and cobalt, the most powerful and stable of the permanent-magnetic alloys, it has become possible to build permanent-magnetic separating equipment, comparable in magnetic strength to the electro-magnetic separators. The initial cost usually is less and no external source of power is necessary. A constant field is available at all times and, of course, is unaffected by external power lags or surges. Since the magnetic field has no external power source, there is no necessity for wires, switches, panels, motor-generator sets, and other auxiliary equipment necessary to produce and maintain an electro-magnetic field.

Maintenance has been reduced to nearly nothing. Hot, cold or wet conditions do not affect the permanent-magnetic field. When fully charged by an extremely powerful electro-magnetic field, the aluminum-nickel-iron-cobalt alloy will retain its magnetic qualities indefinitely, unless subjected to abnormal conditions.

Resistance to Stray Magnetic Fields (Fig. 1)—The ability of a permanent-magnetic material to withstand stray magnetic fields depends upon the coercive force of the material. The higher the intrinsic coercive force, the greater the resistance to stray magnetic field. The total flux of Alnico, when subjected to a 50-cycle alternating field of 50 gausses (equal to 100 ampere-turns per inch), decreases less than 1 percent. When subjected to an alternating field of 250 gausses, the decrease is approximately 10 percent.

Resistance to Temperature (Fig. 2)—The internal structure and the metallurgical properties of a permanent-magnetic material determines its resistance to high temperatures. Properly designed and processed, aluminum - nickel - iron-cobalt alloy can be safely operated at temperatures up to 600 deg. F.

Resistance to Vibration and Impact (Fig. 3)—Some years ago Mill Mutual Fire Prevention Bureau, Chicago, conducted a vibration test on an Alnico magnetic separator installed on a heavy hammermill, during which time it was subjected to severe vibration. The results showed no appreciable loss of magnetic field.

In light of the evidence, it is safe to conclude that properly built aluminum-nickel-iron-cobalt magnetic separators, operating under normal conditions, will maintain their full strength, even though they are constantly working at removing tramp iron from material.

At the present time there are two

basic types of permanent-magnetic separators being used for removing tramp iron from coal:

Plate Type—As the name implies, this is a flat unit consisting of a series of Alnico magnet castings mounted on magnetic steel plates and surrounded by an insulation strip of non-magnetic material which provides a lip to prevent the leakage of both material and magnetism when mounted as a part of the bottom of a metal chute or cast-iron hopper.

This flat type of non-electric separator has the advantage of being flexible in design and very easy to install in existing or new equipment. The face of the magnetic separator becomes a part of the bottom of a gravity-flow chute or hopper and, when coal flows over the face of the magnetic separator, all ferrous iron is pulled to the magnet and held there while the clean material flows on.

Plate Magnets Economical

Non-electric plate magnets provide the most economical means of removing an occasional piece of foreign metal and often are installed following overloaded magnetic pulleys that may be passing iron.

Plate-type magnets will not be 100 percent effective where the depth of coal is greater than 5 in., or where the pitch of the chute or hopper is in excess of 60 deg. During the past six months powerful plate-type magnets with extremely high field strengths, built of abrasive-resistant steel with stepped face plates behind which metal will lodge, have been installed for heavy-duty service in a good number of plants.

Most plate-type magnets are rectangular in shape, the long measurement extending the full width of a gravity-flow hopper or chute. However, trapezoidal and other shaped units sometimes are produced to fit particular existing equipment.

A number of plate-type separators are installed and working efficiently in chutes conveying all grades of coal. Chutes which carry the coal from the main conveyor or hopper in the tipple to shaker screens are logical places for such units. Plate-type magnets also are installed in shaker screens, as well as in chutes leading directly into coal-washing systems. Reports indicate that these plate magnets are doing a very efficient job of removing the tramp iron.

Tramp iron is manually removed from plate-type magnets by pushing the accumulation along the air gap to the edge of the magnet by means of a sturdy piece of wood or a magnetic hoe. From the edge of the plate it can be picked off easily and thrown into a container.

Pulleys and Drums—Permanently magnetized pulleys effectively remove tramp iron from all non-magnetic material conveyed on a belt, provided the depth of material, belt speed and thickness of belt are not excessive.

As the material reaches the pulley (Fig. 4), the powerful magnetic field attracts and holds the tramp iron to the belt as it passes over the pulley. The non-magnetic material falls freely while the magnetic pieces are firmly held to the belt until it carries them beyond a divider and out of the magnetic field to a chute provided to catch the iron as it drops.

The magnetic-pulley installation, when properly engineered, is an extremely efficient means of tramp-iron removal, since the separation is fully automatic. For most efficient results, however, the maximum operating speed of a magnetic pulley is 40 r.p.m.; even less for most installations. Generally speaking, the lower the revolutions per minute, the greater the depth of material that can be cleaned by a magnetic pulley.

While small-diameter (24-in. maximum) permanent-magnetic pulleys have been on the market about two years, performance records show that such pulleys are successfully cleaning crushed coal up to a depth of 4 to 6 in. on the belt. Permanent-magnet pulleys 30 and 36 in. in diameter are now being produced for heavier installations on run-of-mine coal.

Operator thinking apparently is developing into a trend toward using permanent magnets in conjunction with underground belt conveyors. This type of installation removes the tramp iron from the coal underground. It also provides a means for separating tramp iron from smaller volumes of coal at a number of different places rather than trying to separate it all as it comes into the tipple. It frequently is more efficient and less expensive to install a few small magnetic pulleys rather than one large one. This type of application should be seriously considered by those who are operating or contemplating the use of underground conveyors.

Permanent-magnetic drums, like pulleys, are self-cleaning. The material is introduced to the top of the drum, where a powerful magnetic field attracts and holds ferrous material to a non-magnetic revolving shell. As the shell carries the non-magnetic material through the stationary magnetic field, ferrous material is held and carried beyond a divider plate. In addition to being a magnetic separator, a drum also can be the means of even feeding of free-flowing materials.

The drum has the advantage of being a compact unit, as well as lending itself to installation where automatic tramp-iron removal is imperative but where materials cannot be cleaned by pulleys. This type, however, is limited to small sizes of coal, since heavy lumps will deform the outer shell.

Separators Save Money

Most power engineers and maintenance men are familiar with the excessive wear and damage caused by tramp iron to screens, crushers, hammermills, pulverizing rolls and nozzles. The cost of magnetic separators often is less than the cost of one repair bill and resultant loss of production time. However, only the unfortunate few who have experienced dust explosions or fires are thoroughly cognizant of the hazards that exist when all tramp iron is not removed.

There is an ever-present possibility that foreign metal traveling in a steel chute or conveyor system will strike other metal or concrete with a sharp enough impact to generate a spark in a coal or coke dust atmosphere, thereby causing an explosion. The possibility of sparking is even more prevalent where tramp iron and coal is introduced to steel parts of crushers, hammermills or grinding rolls.

The selection and installation of proper magnetic separation equipment should be made only after a specialist in magnetic equipment has been consulted. The world's most powerful magnet will not do a satisfactory tramp-iron removal job if installed in the wrong location or operating under unfavorable conditions. Look for a point in the processing line where the depth of coal is not excessive and where it is traveling at a moderate velocity.

If such a point is not available, experienced magnetic sales engineers frequently can suggest an economical means of creating a condition which will permit the installation of magnetic protection that will be simple, dependable and, above all, efficient.

MODERN MAINTENANCE practices plus full-length dust-tight axle bearings help to improve service from haulage locomotives.

More From Wheels and Axles

Locomotive Construction for Lower Power Cost and Maintenance—Preventing Bearing and Gear Wear—Getting Results in Building Up Tires by Welding—Reducing Axle Wear and Breakage on Mining Equipment

By FRED W. RICHART
Carterville, Ill.

WITH RUBBER tires and belts assuming greater prominence in mine transportation, many coal-mining men may think locomotive- and loading-machine wheels and axles are on the way out. There are indications, however, that point in the opposite direction. Prefabricated track is just feeling its way; at least four loading-machine builders have featured only track-mounted machines; big pit cars with antifriction journals and automatic couplings have proved their value in the mine; high-speed trips promise worthwhile savings in haulage costs.

There are a lot of mine operators who still believe in rail transportation and many new mines are so equipped. A combination of the elements mentioned has resulted in production records and costs for which no apology whatever need be made. Item by item, needed changes are being made in rail installations by aggressive mine operators.

It is well known that shuttle-car and rubber-belt jobs are laid out by their sponsors according to engineering data that produce satisfactory results. Unfortunately, there are few rail installations that are laid out according to good railroad practice. That applies particularly to haulage track. Good track is the basic requirement for successful haulage.

Two of the essential points in locomotive construction to reduce maintenance costs and power consumption are roller-bearing journals and roller-bearing or grease-sealed axles (the axle motor mounting). Twenty years of mine experience indicates that roller-bearing journals normally last ten years or more. The life of axles, gears and possibly pinions may finally be stretched out to equal the normal life of the locomotive.

It does not seem to be generally

TABLE I—War and Prewar Locomotive Part Life

Part	Years	Number Parts	Number Parts per Locomotive Year	Life of Parts, Years
Journal bearing	Three prewar	5	0.42	19.0
Journal bearing	Five war	90	4.5	1.7
Axle linings	Five prewar	5	0.25	8.0
Axle linings	Five war	33	1.65	1.2
Pinions	Eighteen years to 1948	24	0.43	4.6

Tabulation extended to February, 1948. Listed war years do not coincide with the war but with the use of parts made of wartime materials. Part quality apparently is improving but is not yet up to prewar standards. The warehouse stock also holds back the rate of change.

Welding Treads on Wheels

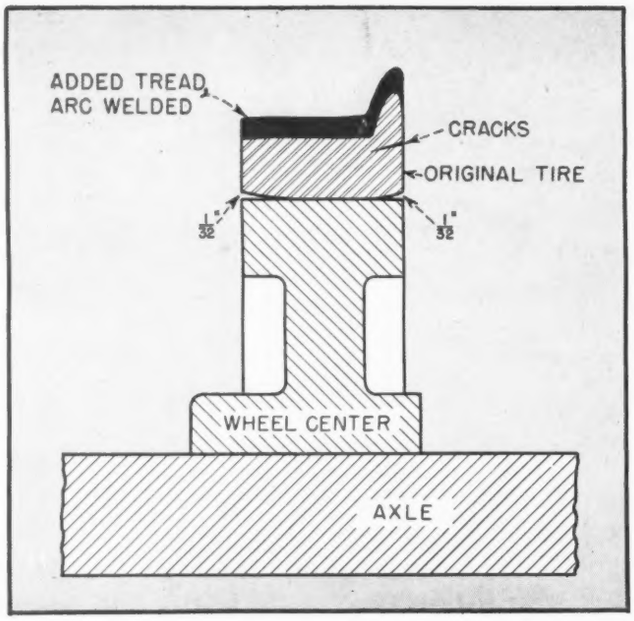


FIG. 1—ARC-WELDED TREAD for loading-machine truck wheel. Weld laid across the cold face of the tire at a 10-deg. angle, also building up the flange. Stresses set up by the cooling of the weld cup the tires on the wheel center and cause cracks under the flange, sometimes breaking off sections.

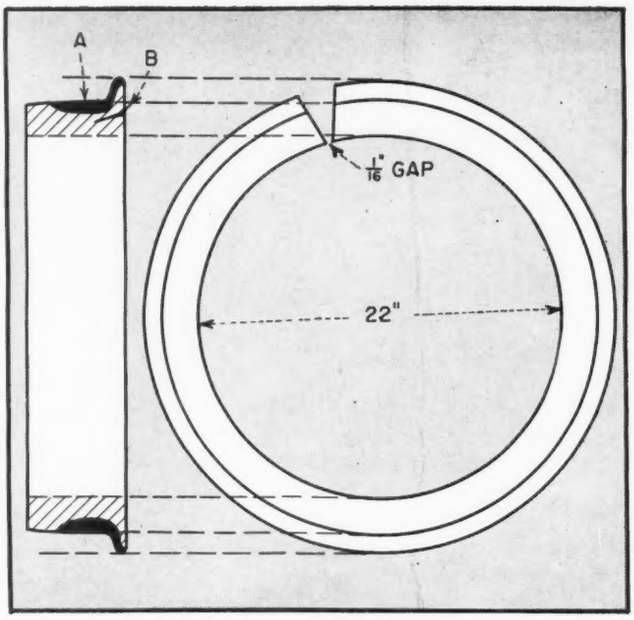


FIG. 2—BUILT UP LOCOMOTIVE TIRE. Weld laid across cold tread at a 10-deg. angle. Stresses set up by cooling open up cracks in the tire, as at "B." Although welding is changed from place to place, it still shrinks the tire and sometimes snaps it. When rewelding, the 1/16-in. gap compensates for shrinkage.

appreciated that wear is caused by dirt and grit that gets into the bearings as a result of defective protective devices, careless handling by maintenance men or lubrication with dirty grease. For those reasons, a clean bearing should be handled in a dustless atmosphere and with washed hands or clean, lintless gloves. It costs coal mines a lot of money to laugh that one off. Maintenance cost of "lubricated-for-life" bearings and pit-car bearings that are seldom removed and handled prove this contention. What gets more use and mechanical abuse than the average pit car? Yet the bearings stack up marvelous records.

Long life of gears and pinions depends on clean lubrication and on maintaining exact shaft-center dimensions. Correct centers can be maintained only if the bearings do not wear. There is no other way to prevent gear teeth from wearing to sharp points. Therefore, the answer is to mount the motor on the locomotive axle so that the bearing will wear little, if at all. Armature shafts of modern locomotives are universally mounted in wear-resistant bearings. Numerous mine locomotives are now built so that the wear of important parts is very small when given proper attention.

This case history tells the story: four 20-ton haulage locomotives, two in service for 20 years and two for 10 years; all practically identical and equipped with roller journal bearings and grease-sealed axle linings; haul is all upgrade with double-shifting during and since the war; two extra wheel and axle assemblies (each with a gear) serve all when a tire change is necessary; no extra gear ever bought; present appearance of the gears indicates many more years of life.

The turnover of roller journal bearings, axle linings and pinions is shown in Table I. The effect of double shifting and poor wartime materials is plainly reflected in the figures, which indicate parts bought rather than parts used. They cover various stated locomotive-year periods. As may be noted, the wartime increase in some parts was six to ten times prewar purchases. As an aside, it is worth noting that the only pinion lost over the first 10 or 12 years resulted from a broken armature shaft.

Steel is the basic metal from which machines are built. Most of us do not yet appreciate the qualities that make it so valuable. One of its characteristics is that it behaves much like rubber. It is elastic within certain limits. It will stretch when stress is applied, compress when pressure is applied, and then return to its original form when the stress is removed. A locomotive wheel rolling along a rail flattens at the point of contact, just as an automobile tire does. The rail will be depressed by the wheel.

Another characteristic of steel is that it expands when heat is applied and will return to its original length when it cools off. The change is considerable. For example, a steel bar 1 ft. long will expand 0.04 in. when heated to 500 deg. F. Theoretically, it would take about 40,000 lb. tension to stretch the same bar the same length. However, the bar would have failed before that tension had been reached. A 30-in. locomotive tire will open up 0.10 in. with the same rise in temperature, permitting it to be easily laid over the wheel center.

Electric arc welding has become one of the principal methods of fabricating and repairing machine parts. Some of the recent practices in the maintenance of locomotive- and loading-machine wheels and axles are of general interest. Some have proved to be sound practice while others are off trail. These experiences are well worth studying as a guide to better ways of doing things or indicating methods to be avoided.

The shrinking of tires on wheel centers compresses the metal all the way to the bore and reduces its diameter. Likewise, building up a worn tire by arc welding, with beads laid on circumferentially as in automatic welding, will shrink both tire and wheel center, making it grip the axle more firmly. This was experimentally proven by an Illinois coal company in its shop.

This company increased tire thickness of the wheels for track-mounted loading machines to give them more road clearance. This was done by building up the tire by arc welding, laid on circumferentially by hand. The usual process was to remove the wheels from the axles in a hydraulic press, build them up, grind the reduced bore to correct dimensions and press them back on the axles.

Wheel-Bore Shrinkage Tested

A test was made of the effect of shrinkage of the wheel bore resulting from tension set-up by the built-up tread. Normally, 20 tons pressure was required to remove the wheel from the axle. When the job was completed 100 tons would not budge the axle in the wheel. The tension of the built-up tread is very much greater when the weld is laid on a cold wheel than if the wheel is preheated and kept hot during welding.

Another Illinois coal company had an arc-welding experience of a different sort in building up the same make of loading-machine wheel treads. The beads were laid across the wheel tread by hand at a 10-deg. angle from the axle. The wheels were cold and the tires, as in the other case, were not removed from the wheel center. The welding was not continuous around the wheel but a few beads were laid together, the wheel was rotated to a cool spot and another series of beads laid.

What happened is shown in Fig. 1. Two things plainly indicate the terrific stresses set up by cooling of the new metal. First is the cupping of the cross-section of the tire so it rests on the wheel center like a rocking chair on a floor. Second, cracks develop on the outside of the flange side of the tire, often long enough and deep enough to cause sections of the flange to break off. It is evident that the stress is enormous when it cracks the mother metal. It is no wonder locomotive tires sometimes snap in two.

The same company builds up worn locomotive tires by a like method. The same sort of flange cracks often appear. If not too long, these are burned out with a torch and the cavity filled by arc-welding. If very long, the tire is sent to the scrap-pile. If a tire snaps in two, the break is veed to the outside, the tire is clamped in position to leave a 1/16-in. gap on the inner circumference and the vee is filled. This allowance makes a satisfactory fit when shrunk on the wheel center (see Fig. 2).

A commercial tire-welding shop has introduced some new practices and refinements of old practices in tire rebuilding that indicate longer life for rebuilt locomotive tires, including an improvement in a gas burner for heating tires, the use of higher carbon electrode and tungsten-carbide lathe tools, and high-speed turning of the tires. In this shop the metal is applied by automatic electric welding laid on circumferentially.

Preheating tires and keeping the temperature up to 500 deg. F. while welding is not new. It is a practice that prevents tires from snapping in two. But the method varies. In this shop coal gas is mixed with air and fed into what is equivalent to a bunsen burner, which produces a clean blue flame. The burner was made of a 2-in. wrought-iron pipe 24 in. long, with two rows of 5/64-in. holes drilled on ½-in. centers. these holes are on the topside of the pipe, which is mounted under the turning tire. The burner is curved to follow the curvature of the tire. A tiny blower forces air into the burner along with the gas. Hand-operated valves control the flow of air and gas to get perfect combustion.

Checking Tire Temperature

Tire temperature is raised to 500 deg. F., which is checked with a Templ Stick. These sticks are made of a compound that fuses at the calibrated temperature. They are quite accurate and may be had for temperatures up to 900 deg. In use, the stick is drawn across the hot surface like chalk. If the mark fuses, the rated temperature has been reached.

Tires are removed from the wheel center for welding and are wire-brushed to remove rust and scale. The electrode used is 0.70 to 0.80 carbon, ¼-in. diameter, laid on at the rate of 16 in. per minute. Two tires are built up at a time, one centered in a chuck and the other mounted on a skeleton mandrel.

When built up, the tires are allowed to cool and are then chucked in a turning lathe for finishing. The roughing cut is with a Kennametal tool at about 100 f.p.m. The finishing cut is with a Firthite tool at 150 f.p.m. This leaves a bright smooth finish with a Brinell hardness of 270, compared to 267 for the original steel in the tire.

The life of these tires is approximately 50 percent longer than that of tires built up of the former 0.65 carbon electrodes. No complaint has been made by coal companies using rebuilt tires of the harder electrode. Rail grip has been satisfactory.

Some interesting axle experience has been noted. One large coal company has had worn locomotive axles built up to standard dimensions by metal spraying. This job was done in an outside shop. Apparently the preparation for spraying was not well done, because it cracked off when the trucks were removed for tire rebuilding. This is not a criticism of spraying. This failure does remind us that the foundation for metal spraying must be correctly prepared, and it must be absolutely free from oil.

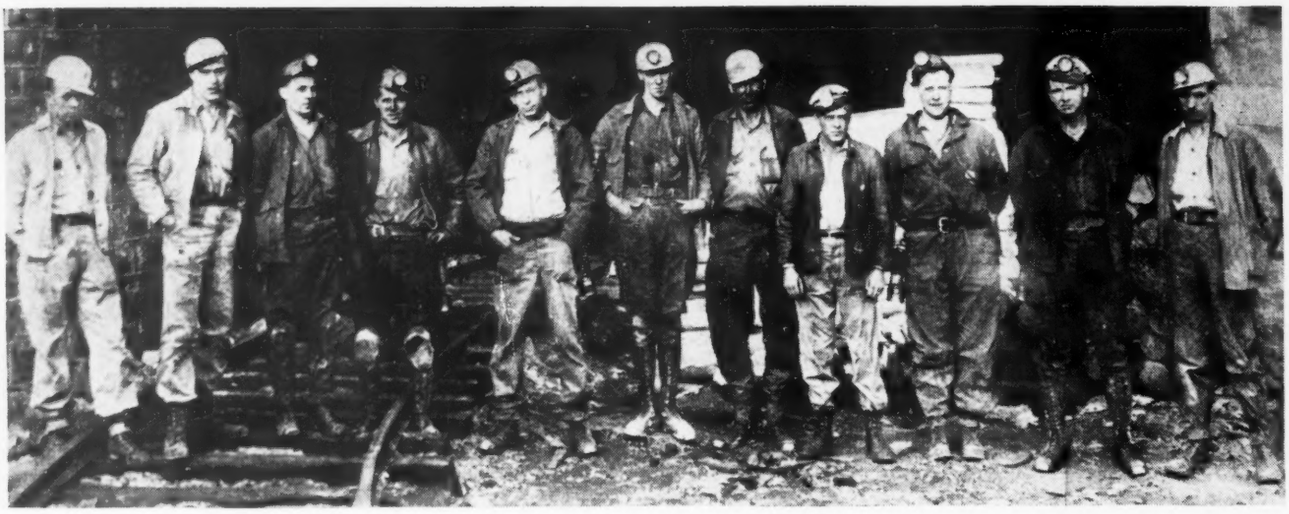
Careful Filleting Needed

Locomotive axles do break. It has been pointed out that such breaks are practically always between the main gear and the nearby wheel. The gear is mounted on a raised "pad" to facilitate its assembly. Many shops have been careless about filleting at the two ends of this pad. That is the chief cause of axle breakage. Sometimes a redesign of the axle with a big fillet will cure the trouble. Simple as this is, nothing is more important about locomotive axles than large smooth fillets where the size changes. Even tool marks should be polished out to prevent the concentration of stresses.

There is no need for mine-locomotive axles to wear appreciably. Roller-bearing journals prevent axle wear at that point. Grease-sealed or roller bearings for mounting the motor on the axle eliminate or reduce axle wear in that area to a trifling amount. We should soon have wheel and axle assemblies, including keyless pressed-on wheels and gears, which last throughout the life of the locomotive, except for its tires.

A roller-bearing or grease-sealed axle mounting for the motor, with solid gears pressed on, plus the ball- or roller-bearing-mounted armature shaft, maintains fixed gear centers and practically eliminates gear-tooth wear.

It is worthwhile to point out again that the extra cost of this construction will be quickly offset by reduced maintenance and continuous, trouble-free operation. Prevention of a single wreck or breakdown might save the cost in seconds of time. The few available records prove the operating value of this modern construction.



Eastern Gas & Fuel *Associate.*

Fred Hill (left), asst. gen. mine foreman; Lance Reid, gen. mine foreman; Frank Corder, John Spriggs, fire bosses; Stanley Cullop, Holland McKinney, section foremen; Ray Trail, third-shift foreman; James Atkins, haulage foreman; Bill Brogan, Fred Pennington, Virgil Elkins, section foremen—Day shift, Stotesbury No. 11 mine, E. G. & F. A., Helen, W. Va.

Coal Men On The Job

W. C. Barton (left), engineering corps, with M. K. Trice, chief electrician, Praco (Ala.) mine, Alabama By-Products Corp.

D. Stewart (left), electrician, Labuco mine, Alabama By-Products Corp., Labuco, Ala., with T. G. Glaze, chief electrician.

Eastern Gas & Fuel *Associate.*

Lamon Wills (left), haulage foreman; A. P. Stevenson, general night foreman; Grant Caudill, Ed Bolt, J. C. McCoy, Peter Thornley, George Brumfield, Fletcher Hutchens, section foremen—Night shift, Helen No. 9 mine, E. G. & F. A., Helen W. Va.

Jim Marquis, shop foreman, Praco mine, Alabama By-Products Corp., Praco, Ala., at his work bench.

Leading the way to greater production

EXIDE-IRONCLAD BATTERIES

and speedy Shuttlecars

The extra tonnage that goes with modern mechanized mining can be yours . . . and at a saving. In more and more mines fast, flexible shuttlecars, powered by Exide-Ironclad Batteries, are upping production and cutting haulage costs.

With Exide-Ironclad Batteries in your shuttlecars, locomotives and trammers you get all four of these vital characteristics of a storage battery: high power ability, high electrical efficiency, ruggedness and long life. They combine to assure years of safe, dependable, day-in, day-out mine haulage service.

SAFE DEPENDABLE POWER

1888 . . . Dependable Batteries for 60 Years . . . 1948

If you have a special battery problem, or wish more detailed information, write . . .

THE ELECTRIC STORAGE BATTERY COMPANY, Philadelphia 32 • *Exide Batteries of Canada, Limited, Toronto*

The Foremen's Forum

How to Operate a Loading Machine Safely

By Roy Schell, Safety Manager
Lorain Coal & Dock Co.

The loading machine, a comparative newcomer to coal mining, requires not only knowledge and skill on the part of the operator but cooperation and teamwork between the operator and his helper. With both of them knowing their job and working together, loading-machine accidents can be held to a minimum.

There are several major causes of loading-machine accidents, as follows:

1. Power Cable Trouble—These accidents usually occur while the men are making a splice in their cable, usually because the cable has been shorted or pulled in two. Men have burned their hands, their legs or their eyes when making a splice because the nips on the cable were not taken off the power line. In other cases, someone has come along and, finding the nips off, has replaced them. Therefore, when making a splice in your cable, always be sure that the nips are off the power line. It is best to leave some reliable person at the nips to make sure they are not replaced until the cable has been repaired.

2. Knocking out Posts With the Machine's Digging Arms—Instead of using a sledge or an axe to knock out a post, sometimes the operator gets in a hurry and tries to knock out the post with the digging arms of his machine. This is bad business. If that post is set tight, it can knock your machine around, causing it to knock out posts along the roadway. Or it can knock the post out in such a way that the cap piece flies back and strikes the operator or his helper.

3. Failure to Pull Down Loose Scale—Sometimes an operator or his helper gets careless and neglects to pull down loose scale on the top or loose overhang on the face or ribs. A safe operator checks for this constantly, never taking a chance. He tests and makes sure. This loose stuff is dangerous. It has injured and killed more men in the mining industry than any other one cause. Nine times out of ten it gives no warning and even if it does give warning, the operator may not be able to hear it because of the noise the machine is making.

4. Failure to Set Roof Jacks at the Right Time—When a loading crew gets into a fresh cut, they first load out the center of that cut, then the right or left rib and then the opposite rib. After loading out the center, the operator should pull his machine back from the face and set two or more roof jacks or posts in the center. Then he should take out the necessary posts on the right or left side to enable him to load out that side safely. Sometimes, operators load out the center, then take out the posts on the side and start to load, without making the center safe. This is dangerous, for it can result in the top beginning to work and raises the possibility of the roof coming in. The least that will happen, if this occurs, is that the operator will have to pull out of the room. The worst is that he and his buddy may be killed.

5. Failure to Leave Clearance—When changing the posts over to get out a different part of the cut, make sure that posts are set with enough clearance for the operator to stand between the post and the machine without being squeezed. Lots of men have been injured because there was not enough clearance.

6. Walking Away From the Machine While It Is Running—The operator never should leave his machine while it is running. If the digging arms strike a solid object when nobody is at the controls, the machine may whip around, knocking out posts and hurting somebody.

7. Running the Machine While the Helper Is at the Face—Sometimes, when a room is being loaded out, the helper will have to be at the face ahead of the machine, taking down loose stone or trimming up the face. Whenever the helper is at the face doing this kind of work, the machine should be stopped and the controls kept OFF until the helper has

How Are You on Maintenance?

This quiz is designed to help you in your supervisory work. Study the questions, check "Yes" or "No" and then turn to p. 112 for explanation.

1. **Do you know exactly how much time your machines lose because of mechanical and electrical failures?** Yes ☐ No ☐
2. **Do you know what repair jobs, such as rewinding an armature, cost?** ..... Yes ☐ No ☐
3. **Have you ever talked to your operators about what repair jobs mean in terms of cost and lost production?** ..... Yes ☐ No ☐
4. **Have you ever given your operators any hints on better handling of their machines?** ..... Yes ☐ No ☐
5. **Do you run your equipment until it quits?** ..... Yes ☐ No
6. **Do you have many tight falls?** ..... Yes ☐ No ☐
7. **Do you know at all times if the voltage at your machines is up to standard?** ..... Yes No ☐
8. **Are all the electrical protective devices, such as fuses and circuit breakers, in place and in proper condition to operate?** ..... Yes ☐ No ☐
9. **Have you made yourself familiar with the lubrication needs of your equipment?** ..... Yes ☐ No ☐
10. **Are your machines regularly checked to see how they are standing up?** ..... Yes ☐ No ☐

MINE LUBRICANTS

MARATHON

785 ATTICA E.P.

NOW GET CONSTANT "FOAM-FREE" LUBRICATION OF EVERY DISC IN CUTTER AND LOADER CLUTCHES

You know how serious foaming can be in Cutting and Loading Machine Clutches. Even the best lubricant can't protect against warping and burning when air bubbles are displacing the lubricant right at the clutch discs.

That's why it's so important to use 785 Marathon Attica E.P. Because it's inhibited against foaming, you get full advantage of its outstanding lubrication characteristics.

It resists extreme pressures. It maintains its viscosity at high temperatures. It is free from oxidation and has low carbon-forming tendencies.

Most important, because it's foam-free, it lubricates *constantly, completely* every plate in every clutch. That means fewer breakdowns on the job, fewer overhauls, less shop time. Good reasons for seeing a Marathon mine lubrication engineer soon. Just write, wire or phone.

A COMPLETE LINE OF MARATHON LUBRICANTS FOR EVERY OPERATION IN YOUR STRIP OR SHAFT MINE

MARATHON

THE OHIO OIL COMPANY

Producers of Petroleum since 1887

GENERAL OFFICES: FINDLAY, OHIO • District Offices: Robinson, Ill., Indianapolis, Ind., Louisville, Ky.

finished his job at the face and is back out of the danger zone created by the digging arms.

This is the safe way—and the best way—to run a loading machine.

—*Lorain-Lorado Journal*

Cutting Haulage Accidents

By J. J. Plasky
Training and Safety Director
Red Jacket Coal Corp.

Accidents from haulage take a great toll of lives in coal mines. A report of a committee assigned to study haulage accidents reveals that in West Virginia during the period 1940-1944, 384 men were killed and 17,205 men were injured in haulage accidents. During the same period, 815 men were killed and 12,109 men were injured by falls of roof.

A relatively smaller number of employees are engaged in haulage and therefore the frequency rate must be used to obtain a uniform comparison. This rate is based on the number of accidents per million hours of exposure. When viewed from this angle, the figures above take on added meaning. During the period mentioned, the frequency rate of fatal haulage accidents was 3.24, as compared to 0.93 from falls of roof. The frequency rate of non-fatal accidents was 144.99, as compared to 13.85 from falls of roof.

The trend of lost-time injuries from roof falls has been downward while that of lost-time injuries from haulage has been upward. The upward trend of haulage accidents is due, in part, to longer hauls, increased speed, heavier equipment, inadequate track and roadbed and poor maintenance of haulage facilities. The improvements in haulage facilities must keep pace with the requirements of mechanical mining if accidents from haulage are to be decreased.

Careful selection and education of haulage employees is an important factor in the prevention of haulage accidents. Most haulage employees are young men because the work requires both mental and physical agility and good eyesight. The fact that an applicant for a job on a motor has had previous experience is not always proof that he is qualified to perform the job safely. He should prove his ability in actual service.

Haulagemen, because of their youth, may be inclined to be reckless. It is important that they be given proper instructions and that they learn the haulage rules, which should be rigidly enforced. Strict discipline of haulage employees is more important than in any other class of underground work because close supervision of such work is not possible, Regular meetings of haulage employees should be held to discuss safe haulage practices.

Defective haulage equipment is a hazard to life and property. Inspection and proper maintenance are necessary to insure economical operation, obtain maximum life of equipment and prevent accidents. Daily inspection of haulage equipment may reveal defects that may be corrected easily. If these corrections are made, a life may be saved or an injury prevented. If any haulage equipment is found defective, it should be taken out of service until the necessary repairs are made. The responsibility for such inspection should be delegated to one individual, usually the mine foreman, shop superintendent or safety inspector. All haulage equipment should be maintained in safe operating condition.

Inspection of electric locomotives should include examination of brake shoes, brake rigging, controller, lights, warning devices, sand rigging, fuses, wiring and cable, trolley wheel or shoe, lubrication, journal boxes, seals, covers, grab irons, motor suspension and accessories such as rerailers, lifting jacks, chain with hooks, fire extinguishers and first-aid kit.

Inspection of cars should include examination of the body, projecting bolts, nuts or sharp corners, brakes (if any), axles, wheels, couplings, wheel gage and lubrication.

The reduction of haulage accidents is the concern of all—employees, management, safety committees and other agencies—and it is going to take the efforts of all to achieve results. The employee has the greatest stake of all in this accident-prevention program because he is the one who suffers death or injury, but that does not mean that all the responsibility must be assumed by the employee. The foreman has his share of responsibility, as well as top management and shopmen.

—Adapted from *The Red Jacketeer*

Cutting Maintenance

"Yes" should be the answer to all but Questions 5 and 6, p. 110. The reasons are:

1. Any cost-reduction program must start with a knowledge of what the losses are and why they occur. In addition, of course, exact knowledge of the time lost is necessary to determine if any improvement has been made and check any tendency to backslide. Accurate records of time lost and the reasons therefore are essential in keeping maintenance cost down. In general, if the time lost as a result of mechanical and electrical failures averages, for all machines, less than about 2 percent of shift time, it is an indication that the problem is being handled reasonably well. If the loss is much more than that, it is time to take steps.

2. It is a real eye-opener sometimes to find out what a mechanical or electrical failure means in repair cost—not to mention loss of production time and increased coal cost. Knowing where you can get hurt the worst naturally leads to steps to reduce the possibility to the minimum.

3. Since operators can make or break a maintenance program, they have a vital part to play in keeping down delays and repair costs. If they are supplied with information on what careless handling involves in tons and dollars and cents, the result should be greater interest in proper machine operation.

4. Interest in doing a better job, stimulated by information on what a better job means, must, of course, be accompanied by suggestions as to how to go about it. One of the foreman's responsibilities, therefore, is to get the necessary information on how to operate machines properly and then pass it on to his men.

5. Keeping things from happening is a major point in maintenance. Therefore, for best results, repairs and replacements should be made before major breakdowns occur. Machines should never be run until they quit because that means a real headache when they do stop.

6. A tight fall is only one of several things that can materially increase machine maintenance. When a loading machine has to buck up against tight, standing coal, as an example, production drops off and wear and tear goes up. The answer is taking all possible steps to prepare the coal and working place so that the machine has the easiest possible job.

7. Low voltage is Public Enemy No. 1 of electrically driven equipment, cables and so on. If the voltage at the motor terminals is kept at the nameplate rating, one of the biggest reasons for increased repair bills is eliminated.

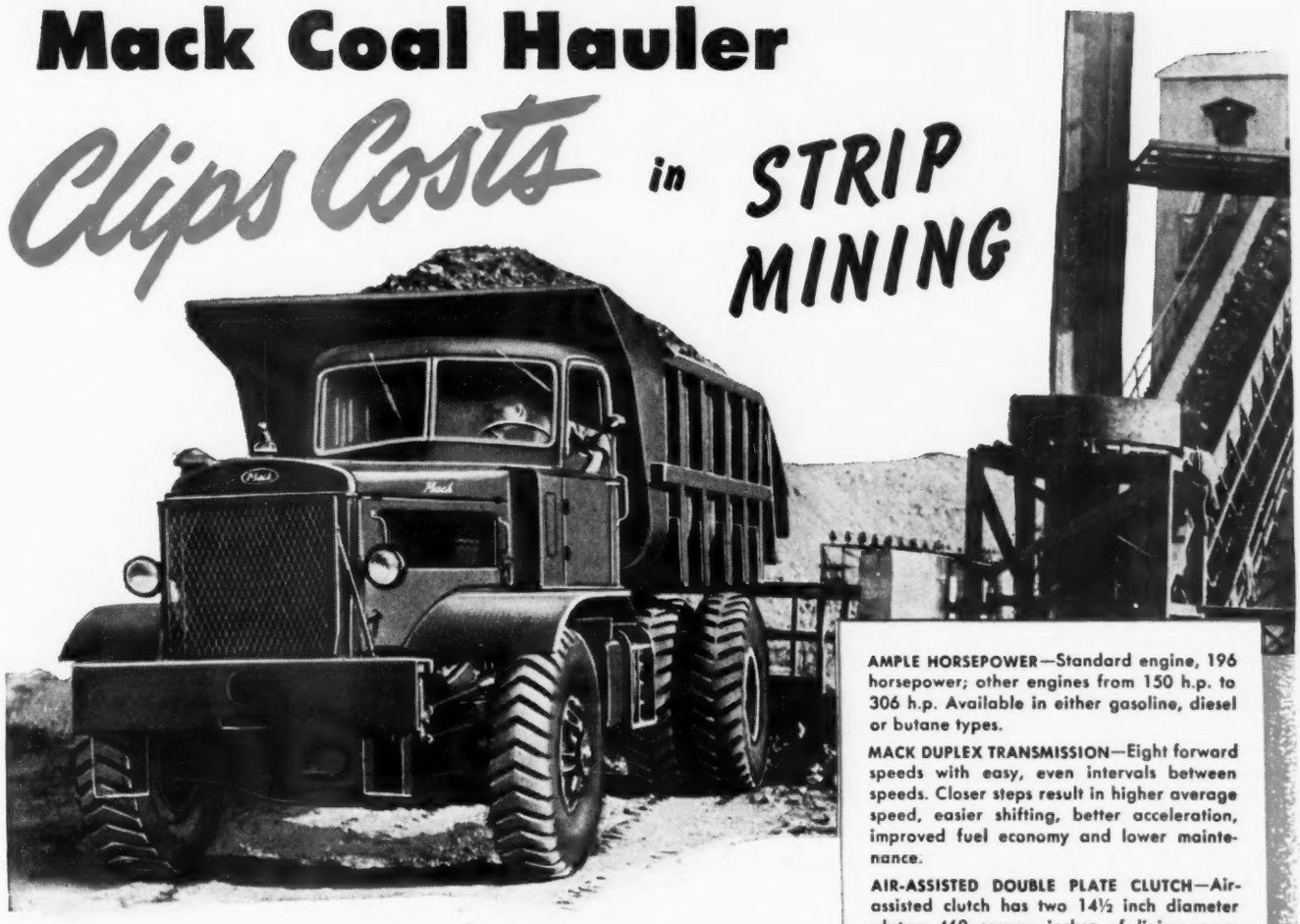
8. Fuses, circuit breakers and other protective devices are designed to keep a minor incident from becoming a major conflagration and a major repair bill. They should always be used, they should be of the proper size or setting and they should not be replaced by substitutes, such as solid copper wire.

9. Faulty lubrication ranks next to or perhaps equal with low voltage as the major cause of big repair bills. Not only does poor lubrication result in bearing destruction and down time, it also can cause major electrical failures. An example is a worn bearing that lets an armature down on the frame. The answer is good lubricants and proper use.

10. To prevent trouble before it occurs and thus keep maintenance down, regular inspection and checking of machines and parts is absolutely essential.

Mack Coal Hauler

Clips Costs in STRIP MINING



● Here's the answer to a definite truck need in strip mine coal hauling. It's Mack Model LR — a four-wheel dumper with 180" wheelbase — engineered tough and strong in every part to meet the specific job demands of this exacting service.

Powerful and rugged, Model LR loads out from under the shovel with 15 tons of coal. Offered as a complete unit, its chassis, hoist and body are designed to work together with highest efficiency and utmost ease of control.

Model LR brings to its job all the advantages of Mack's exclusive super-duty truck construction — plus new advances in maneuverability, driver vision, easy steering, positive traction and maintenance accessibility.

Check the stand-out features listed in the box at right. For more detailed information write to Off-Highway Division, Mack Trucks, Inc., Empire State Building, New York 1, N. Y.

AMPLE HORSEPOWER—Standard engine, 196 horsepower; other engines from 150 h.p. to 306 h.p. Available in either gasoline, diesel or butane types.

MACK DUPLEX TRANSMISSION—Eight forward speeds with easy, even intervals between speeds. Closer steps result in higher average speed, easier shifting, better acceleration, improved fuel economy and lower maintenance.

AIR-ASSISTED DOUBLE PLATE CLUTCH—Air-assisted clutch has two 14½ inch diameter plates; 460 square inches of lining area; makes possible almost effortless operation.

MACK POWER DIVIDER—Assures good going through slippery mud and over uneven ground by effectively transferring power to the wheel having the best traction.

MACK PLANIDRIVE REAR AXLE—Three-pinion planetary final reduction gears, located outboard of each wheel, provide large reduction without excessive size of carrier, differential or axle shafts.

POWER STEERING—Hydraulic power steering is shock-proof, positive and fast—gives easy, effortless control.

ALLOY STEEL I-BEAM FRAME — Electrically welded into one piece. Massive cross members welded to huge 12½" x 6⅜" I-beam side members to form a one-piece frame.

MASTERFUL AIR BRAKES—Air-actuated foot brakes provide nearly a thousand square inches of braking area. Hand brake operates on propeller shaft and is air-interlocked with rear wheels.

RUBBER SUSPENSION—Mack rubber Shock Insulators on front springs and rear axle support-arms eliminate twisting strains, absorb vibration, require no lubrication or adjustment and last indefinitely.

RUGGED DUMP BODY—Dump body of scoop-end type is of heavy gage steel, strongly braced and specially designed for capacity of 15 tons of coal.

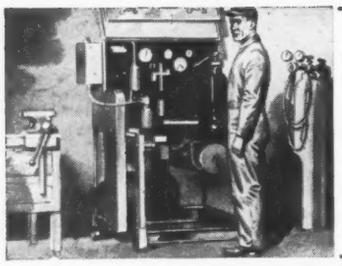
HIGH-SPEED DOUBLE-ACTING HOIST — Hydraulically raised and lowered. Load can be dumped in 15 seconds and body returned in same time.

DRIVER COMFORT — Offset driver's position gives better vision both forward and to the rear. Driver's seat is fully adjustable and has hydraulic shock absorbers.

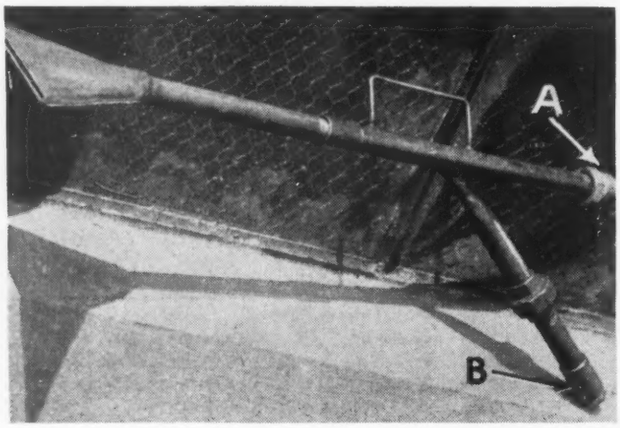
Mack

trucks for every purpose

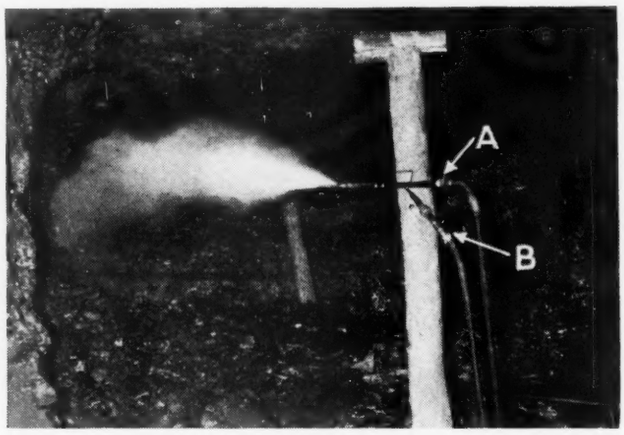
Mack Trucks, Inc., Empire State Building, New York 1, N. Y. Factories at Allentown, Pa.; Plainfield, N. J.; New Brunswick, N. J.; Long Island City, N. Y. Factory branches and dealers in all principal cities for service and parts. In Canada, Mack Trucks of Canada, Ltd.



Operating Ideas



FOG GUN DETAILS—Air line "A"; water line "B"; nozzle with 30-deg. arc and 1/8-in. slit; bent welding rod for handle.



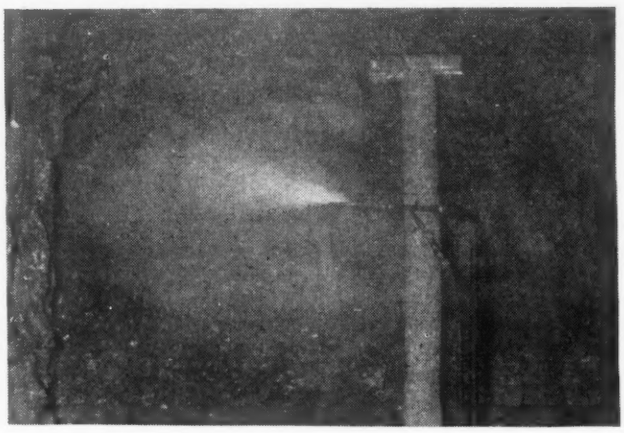
FIVE SECONDS after start, fog gun, suspended on timber post, begins to fill area with minute water droplets.

Fog Gun Cuts Dust and Gas After Blasting

A FOG GUN that decreases, through flocculation, the dust produced by blasting and absorbs nitrogen-oxide fumes released by explosives is being used by The Hudson Coal Co., Scranton, Pa., in multiple-shift operations where rock is being shot and where air contaminants cannot be diverted from adjacent places. The gun, shown in detail and in operation in the accompanying photographs, is a modification of similar fog guns used in metal mines, the only difference being in the flat or "fishtail" design of the ejection nozzle.

The nozzle, designed by Samuel Hockaday, maintenance foreman, Baltimore No. 5 colliery, The Hudson Coal Co., produces a fog pattern approximately 14 ft. wide and 8 ft. high at a distance of 25 ft. The fog is created by the swirling action of compressed air entering the pronged tube "A" and picking a small stream of water which enters the tube at "B." This action breaks the water stream into minute droplets, which are ejected into the air at the working place.

The working procedure is as follow: With air and water lines connected, the gun is suspended on a prop or timber leg within 25 ft. of the working face. After the charged holes are connected at the face, the air and water are turned on. The shots then are fired. In the interval between turning on the fog and firing the shots, the fog wets the face vicinity. After shooting, it wets the dust and fumes. Tests made after shooting showed the following results: fumes and gases were reduced 30 percent and dust concentrations 43 percent during the first 2½ minutes after blasting. During the next six minutes after blasting, the reduction was 79 percent. These tests were run in a coal chamber 24 ft. wide, 9 ft. high and 150 ft. long with an average air volume of 5,000 cubic feet per minute. The fog pattern covered only about 60 percent of the cross-sectional area of the chamber, thus enabling some particles to escape around the edges of the fogged area. Even better results are obtained in rock tunnels and narrow development places, where the fog pattern fills the entire cross-sectional area and wets most of the particulate matter. In wide places producing heavy concentrations of dust and gas that are airborne to adjoining workings, it is possible to use two guns, one on each rib.



THIRTY SECONDS later fog has saturated air. Dust and gas after blasting will be reduced up to 79 percent.

The gun is made of ¾-in pipe with a handle made of a welding rod. The water line, "B," is reduced to a ¼-in. orifice and enters the air line at a 45-deg. angle. The water stream then is bent to discharge parallel to the air stream. The point of water discharge is 10 in. from the air entrance. The flared nozzle, with an arc of 30 deg., starts 12 in. from the water orifice and has a width of 6 in. with an opening of ⅛ in.

The fog gun operates effectively where the water pressure is equal to or slightly greater than the compressed-air pressure but best results are obtained when water pressure is kept about 10 lb. per square inch below air pressure. Operation of the gun does not require the full capacity of a ¾-in. air line. About 20 cubic feet per minute for a five-minute period is sufficient to produce a fog volume that will allay concentrations released during ordinary blasting.

Longer Life . . . Less Maintenance for PENN Truck Bodies with J&L JALLOY

HEAT-TREATED STEEL

J&L STEEL

Leading Dump-Truck Body Builder Pioneers Use of Heat-Treated Steel for Bottom Plates

Hockensmith Corporation, Penn Body Division, of Penn, Pa., puts real meaning in its slogan: "*Strength • Service • Economy*" by using J&L Jalloy and Otiscoloy steels.

J&L Heat-Treated Jalloy for truck bottoms resists the terrific shocks and abrasion encountered in heavy-duty operations, while J&L Otiscoloy High-Tensile Steel frame members and other parts reduce dead-weight to a minimum without sacrificing strength.

One mine operator reports that his stone trucks equipped with heat-treated Jalloy run an entire season without bottom replacements—an unheard of record in the mining industry where the materials handled are highly abrasive. In addition because longer wear reduces repair, his maintenance welding crew has been cut *84%* since using Jalloy!

J&L Jalloy is a *modern* steel for products that must be tough and strong—heavy-duty truck bodies, power-shovel buckets, dump-cars, bulldozers, scrapers, rock crushers, sand-blast equipment, and wherever abrasion is a limiting factor in the life of a product.

J&L Jalloy—a fine-grain, heat-treated steel—has an inherent ability to withstand impact and abrasion. A wide range of physical properties, with strengths up to *155,000 lbs. per sq. inch*, are available.

If you need a steel with *better* abrasion resistance, or if you want longer life from products made of steel, let us send you data on J&L Jalloy, including information on properties, heat-treatments and workability. The data booklet: "Jalloy—J&L Alloy Steel" is available on request. Use the coupon.

Jones & Laughlin Steel Corporation
Room 411, Jones & Laughlin Building
Pittsburgh 30, Pennsylvania

Please send me complete data on Jalloy and the booklet: "Jalloy—J&L Alloy Steel."

NAME_____

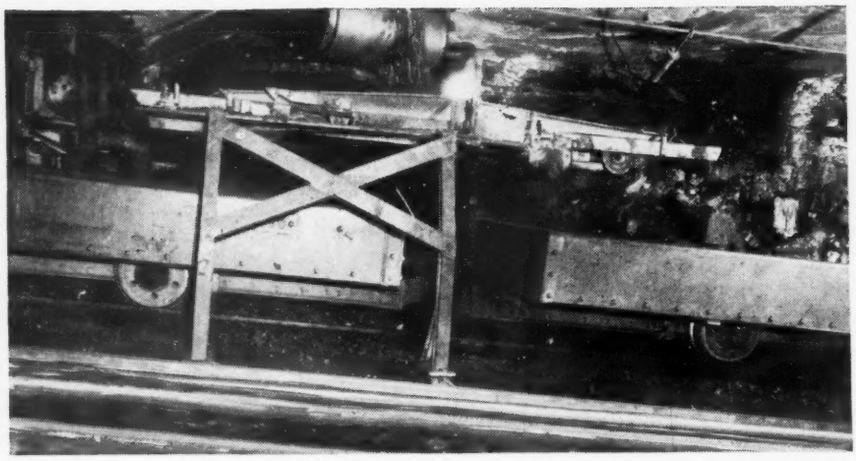
TITLE_____

ADDRESS_____

CITY_____ STATE_____

JONES & LAUGHLIN STEEL CORPORATION

ROSCOE A. CLINE, left, and Andy Doci, mine mechanics at Lorado No. 5 mine, invented the belt-to-car transfer unit.



A PIVOT ARM, making contact with the end of the loaded car, advances the belt-to-car transfer unit about 42 in. as the car change is made. Coal is about to be directed to the empty through the rear hopper.

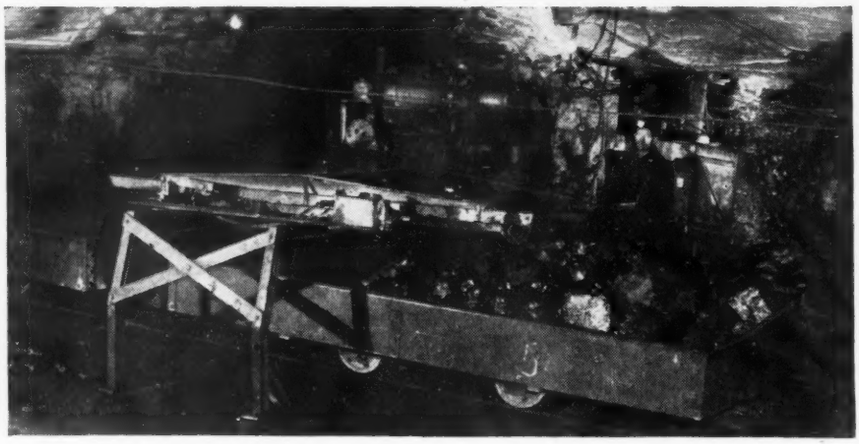
Cars Changed While Belt Runs

A DOUBLE-HOPPER belt-to-car transfer unit prevents having to stop the belt when making a car change at the belt discharge station at the Lorado No. 5 mine, The Lorado Coal Mining Co., Saunders, W. Va.

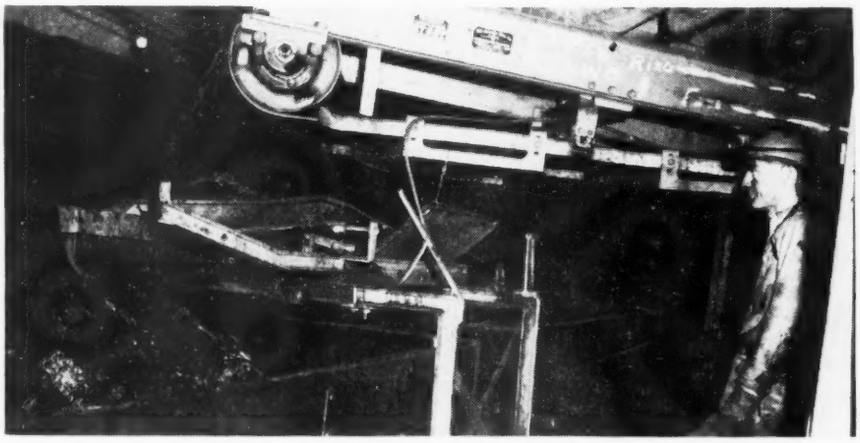
The transfer unit, shown in the accompanying illustrations, was invented and patented by Roscoe A. Cline and Andy Doci, mechanics at the mine. The entire assembly weighs approximately 800 lb. and consists of twelve demountable pieces. The principal parts include the hopper, rails, frame legs, contactor frame and release rail. The hopper is mounted on six ball bearing wheels that operate on a track. The heaviest piece weighs 75 lb. and the entire unit may be assembled in approximately two hours.

The hoppers are 80 in. long, 54 in. wide and 12 in. high. The width of the car determines the width of the hoppers. The height of the frame is governed by the height of the belthead and the car. A 12-in. space is needed between the top of the car and the belthead to accommodate the transfer unit. The capacity of the steel cars at Lorado No. 5 is 3½ tons and often the cars are loaded to 150 percent of their cubical capacity.

The transfer unit operates as follows: (1) As the loaded car, Fig. 1, is moved from under the belt discharge station, the end of the car engages a pivot arm on the hopper carriage and advances the hoppers a distance of 42 in. (2) After the hoppers have been advanced, the arm disengages automatically and an electrical interlock secures the hopper assembly at this position. (3) The *rear* hopper directs the coal from the belt into the empty car. (4) Upon the release of the interlock through a push-button station, the hopper assembly gravitates to the position shown in Fig. 2 (photographed after the empty had been moved once after the loading operation was begun). A latch on the side of the carriage secures the hoppers at this position. (5) In this position, the one for normal loading, the *front* hopper directs the coal into the forward end of the car. The car, Fig. 2, will be moved twice before the pivot arm, attached to the hopper carriage, contacts the end of the car to move the hopper assembly forward 42 in. as the trip is jogged ahead in making the next car change.



THE HOPPER CARRIAGE has been returned to the normal loading position and latched. Front hopper directs coal into the car being loaded.



OPERATOR'S SIDE showing how the pivot lever with roller and the release rail function to operate the pivot arm that contacts the end of the car to advance the transfer unit.

with insulated ALUMINUM power and feeder cable

AND YOUR SUPPLIER HAS IT!

Here's proof of aluminum's economy for power and feeder cable—from a recent installation (name of mine furnished on request):

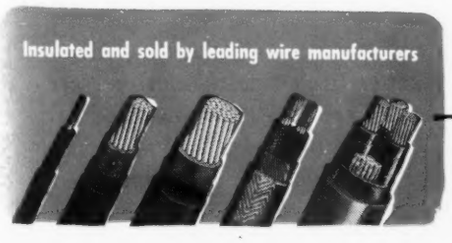
The mine superintendent estimates he saved $1,000 on 15,000 ft. of No. 2/0 and 8,000 ft. of No. 4/0 insulated cable with Alcoa E.C.* Aluminum conductor.

He saved $200 on installation. Two men handled the lighter aluminum cable, although four used to be needed.

The electrician says, "For once I have more power than I need." (No. 2/0 and No. 4/0 cable with RH insulation have less voltage drop than the previous conductors . . . yet cost less!)

On your next cable replacement job, see how much you can save—ask your electrician to *figure it in aluminum!* Insulated wire and cable with light, strong, conductive E.C. Aluminum is available in sizes up to 1,500,000 cm, with insulation developed to stand up under abrasion and moisture. And Alcoa Aluminum conductor doesn't bat an eye at acid mine water! Ask your wire supplier, or write ALUMINUM COMPANY OF AMERICA, 1763 Gulf Building, Pittsburgh 19, Pennsylvania.

*E.C.: *Electrical Conductor* Aluminum



ALCOA EC ALUMINUM

FOR ELECTRIC WIRE AND CABLE

REPAIRING ROADS, loading trucks with stockpiled coal and moving equipment make . . .

Tractor Loader a Versatile Pit Unit

FINAL CLEANING of overburden from coal precedes loading.

IN ADDITION TO CLEANING the final overburden off the coal, a Hough Model HF Payloader in use at the Cedar Valley Mining Corp.'s strip mine south of Oakland City, Ind., loads stockpiled coal into trucks near the tipple; handles crushed rock for road repairs; strips heavy, wet clay packed into haulage-road ruts; transports supplies and repair parts; and helps in moving and setting up water pumps.

The initial step in stripping is removal of from 10 to 35 ft. of overburden with a Northwest 80D dragline. Then the Payloader, as shown in the accompanying illustration, moves in for the final cleaning operation, which is done quickly, thoroughly and with practically no breakage. Large pneumatic tires enable the machine to maintain traction without grinding the coal under the wheels. This cleaning formerly was done by three men with hand shovels. Now, the Payloader with one man cleans 500 tons a day and has time left over for other jobs as well. After it has completed its work, a Marion 450 shovel loads the coal into eight 9-ton trucks for the trip to the tipple, which has a capacity of 700 tons per day.

When the Payloader is not operating on the coal seam, it loads trucks from stockpiles near the tipple. Working directly from stockpile to truck, the ¾-yd. bucket enables the operator to load more than a ton a minute.

In road-repair work, the machine, in addition to loading crushed rock, strips off wet-packed clay from the high spots of ruts to ready the roads for dumping of the surfacing material. Because of its maneuverability, it is used also to transport supplies and repair parts from the maintenance shops to mechanical equipment in the pit, thus eliminating the use of trucks needed elsewhere.

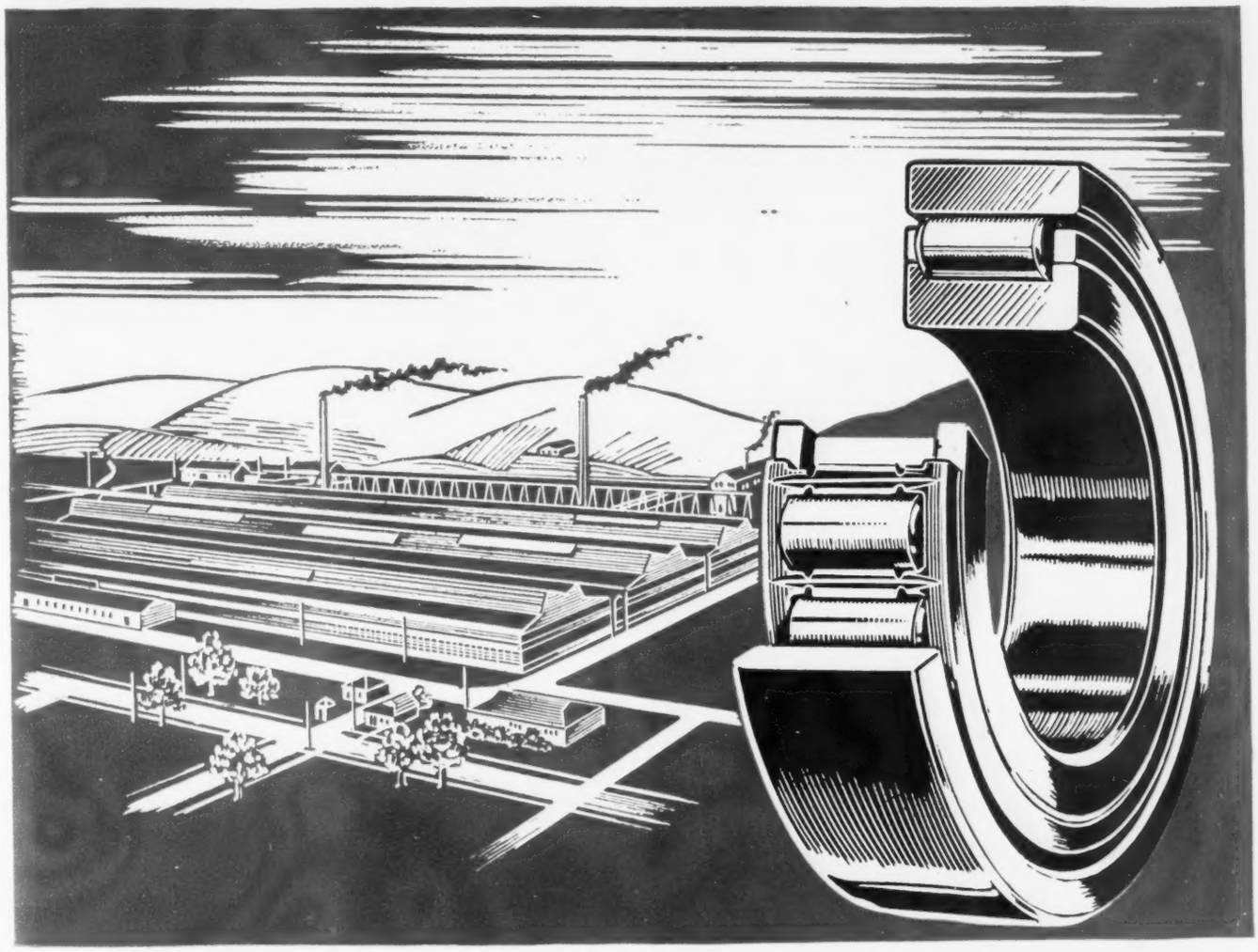
The Payloader also has added speed to the job of moving and setting up pumps. The Payloader piles the dirt into a mound to get the pump above water level and then moves the unit quickly from its former location.

In these and other ways, use of the Payloader helps the operation by decreasing breakage losses, increasing production capacity and cutting cost. Good preparation to enhance the already high quality of its product is stressed by the Cedar Valley organization.

What's the Idea?

For your ideas on safety, maintenance, production, modification of machinery, etc., COAL AGE pays cash upon acceptance. They don't have to be big ideas, because little ones sometimes are just as good. Write down the details of your ideas, take a picture or two if you can and send them into the Editorial Department.

YES! Tycol Acylkup Greases perform better...BETTER...BETTER



Tycol Acylkup Greases perform better because:

. . . *Tycol Acylkup Greases* contain paraffine base cylinder oil, thus assuring greater load carrying capacity and a strong "film of protection."

. . . *Tycol Acylkup Greases* are water-repellent and blended with the finest calcium soap, enough to make every application "stay put" at all times.

. . . *Tycol Acylkup Greases* have a smooth, non-fibrous structure that permits easier application in grease guns and central lubricating systems.

. . . *Tycol Acylkup Greases* safeguard precision anti-friction bearings and heavily loaded gears alike . . . *save* by standardizing on Tycol!

Complete information on Tycol Acylkup Greases is available from your nearest Tide Water Associated Office. Call or write in today.

LUBRICATION—"ENGINEERED TO FIT THE JOB"

TYCOL
INDUSTRIAL LUBRICANTS

Boston • Charlotte, N. C.
Pittsburgh • Philadelphia
Chicago • Detroit • Tulsa
Cleveland • San Francisco

TIDE WATER ASSOCIATED OIL COMPANY
17 BATTERY PLACE - NEW YORK 4, N.Y.

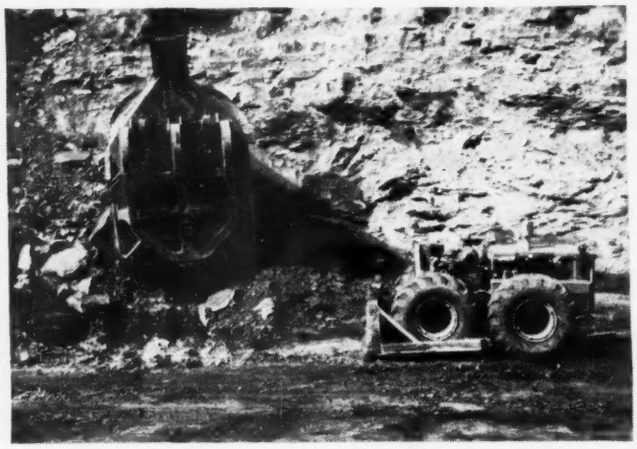
ACTING AS ITS own feeder, the shaker takes the rock from the rotary-dump bin and discharges it over the hill at the far end.

Self-Feeding Shaker Conveyor Handles Rock Disposal

WHILE A ROTARY DUMP took good care of the problem of getting rock and mine refuse out of the cars at the Blue Rose mine of the New Jellico Coal Co., Morley, Tenn., there still remained the problem of getting it out onto the dump. The first thought was to use a self-dumping larry already on hand at another location. Upon further consideration, however, it was felt that the answer was a shaking conveyor which also could act as its own feeder.

The installation, using a Goodman shaker unit, is shown in the accompanying illustration. The rock is discharged into an open-topped bin with sloping bottom lined with sheet iron. The bin feeds through a narrow throat to the drive end of the shaker, which therefore acts as its own feeder. At the far end, the shaker dumps the rock over the side of a steep hill. When desirable, plans call for moving the outer end of the shaker to one side or the other to fan out the dump and increase the capacity.

Shock To Dipper Hinge Pins Relieved



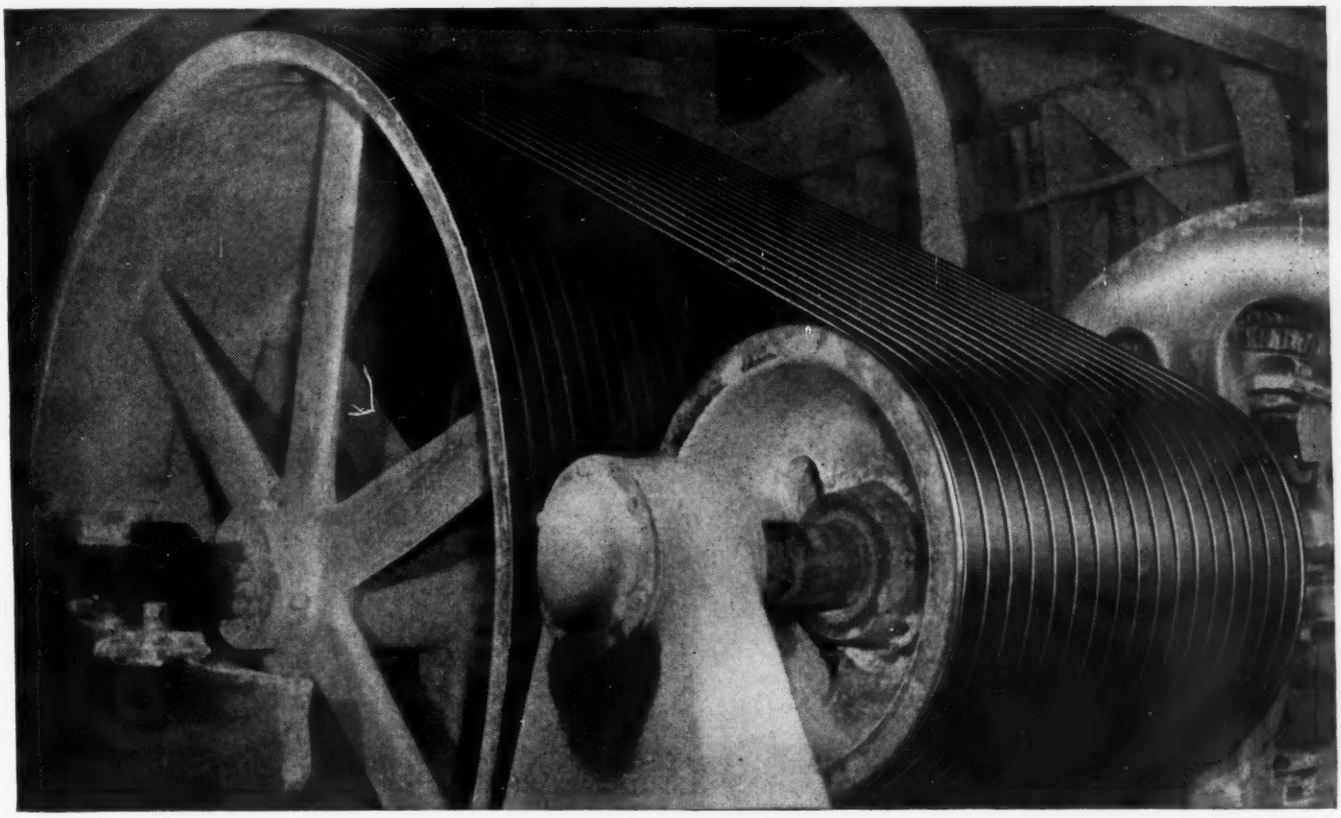
THE THREE HINGE pins of this 40-yd. dipper are protected against shock by rubberized-steel bushings. Each steel bushing is protected by rubber walls inside and outside.

GOOD FRAGMENTATION of highwall material also helps to minimize dipper troubles by breaking up large boulders, thus reducing shocks to the dipper hinge pins.

RUBBER-PROTECTED BUSHINGS have reduced the shearing of hinge pins on the two 40-yd. dippers at the Georgetown No. 12 mine, Hanna Coal Co., St. Clairsville, Ohio. The old-style unprotected steel pins were victims of metal fatigue and failed due to boulders striking the dipper door from the inside. Each pin failure used to mean quite a delay, which halted production, idled men and machines and pushed costs upward.

Each of the three hinge pins on the 40-yd. dipper, shown in the accompanying photographs, is cushioned by special 4½-in. long steel bushings that are lined with rubber, inside and out.

The rubberized bushings were fabricated by the Firestone Industrial Products Co. Each consists of a ½-in. thick by 4½-in. long steel bushing and two rubber cylinders telescoped together. The inside rubber cylinder has a ⅝-in. thick wall, while the outer one has a ⅞-in. wall. Both rubber cylinders are bonded to the steel bushing to make a durable rubberized bushing that absorbs shocks, cuts costly delays and assures long and efficient life for dipper hinge pins.



Production Rises Sharply When Drive Slippage Eliminated on 60-Ton Grinder

This ponderous tube mill of a large Wisconsin quarry pulverizes crushed stone into 100-mesh fineness for making agricultural lime. Loaded, the mill weighs 60 tons! Starting it from a dead stop and keeping it turning as chunks of stone resist the grinding action requires a drive with terrific pull. The original drive couldn't deliver . . . slipped constantly . . . slowed production seriously. According to the plant superintendent "the belt was off the pulley more than it was on". On the recommendation of the local Dayton V-Belt Distributor a drive of 17 standard Dayton E-section V-Belts was installed.

This was four years ago. Since then slippage has been completely eliminated, there has been no stalling of the tube mill and production has risen sharply.

Your local Dayton V-Belt Distributor can assist you in solving similar power transmission drive problems. With his specialized knowledge he can correct nearly 95 per cent of all power drive troubles by using standard Dayton V-Belts and the power drive accessories that he stocks. If additional engineering knowledge is needed he can quickly secure the aid of a Dayton Power Transmission engineer. So for prompt, profitable solutions to your drive problems call your local Dayton V-Belt Distributor.

THE DAYTON RUBBER COMPANY
Main Office and Factory: Dayton 1, Ohio
Branch Offices: Atlanta, Boston, Chicago, Cleveland, Dallas, Detroit, Los Angeles, Minneapolis, New York, Philadelphia, St. Louis

V-Belt Buyers! A leading mill supply house near you offers specialized Dayton V-Belt service. Look for the name under the trade name heading "Dayton V-Belts" in the yellow pages of your telephone directory.

Dayton Rubber

THE MARK OF TECHNICAL EXCELLENCE IN NATURAL AND SYNTHETIC RUBBER

CALL IT THE "COMPOSITE VALVE"—the giant that would result if *all* the valves in a plant were *one* valve. As pictured here, its proportion to other equipment in this detailed model of an automobile factory is fairly accurate. Representing your total valve investment, its size may surprise you, but it must be considered in any plan for economical plant operation.

IT PAYS to keep *your* "composite valve" in mind at all times . . . and thus avoid the common error of dismissing valves as a comparatively unimportant investment. With wages and material costs the highest ever, your total valve expense warrants the same careful attention that you give to operating costs of larger plant units.

EXCESSIVE MAINTENANCE of one inferior valve is insignificant, but multiplied by thousands, it is a serious drain on operating budgets. JENKINS BROS. helps you meet this problem two ways. First, by building extra endurance into Jenkins Valves, making them the longest-lasting, lowest-upkeep valves that money can buy. Second, with advice from Jenkins Engineers on any question of proper selection, installation, or maintenance.

For all new installations, for all replacements, rely on Jenkins quality and engineering for lowest valve costs in the long run. Sold through leading Industrial Distributors.

•

Jenkins Bros., 80 White St., New York 13; Bridgeport, Conn.; Atlanta; Boston; Philadelphia; Chicago; San Francisco. Jenkins Bros., Ltd., Montreal.

"PRACTICAL PIPING LAYOUTS" is a 32-page book containing diagrams and descriptions of 25 basic piping layouts with complete recommendations for valve selection and location in the lines. Tells you "which valve where for best performance". FREE on request. Write JENKINS BROS., 80 White Street, New York 13, N. Y.

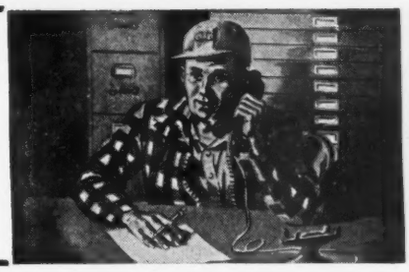
LOOK FOR THIS TRADE JENKINS MARK DIAMOND MARK

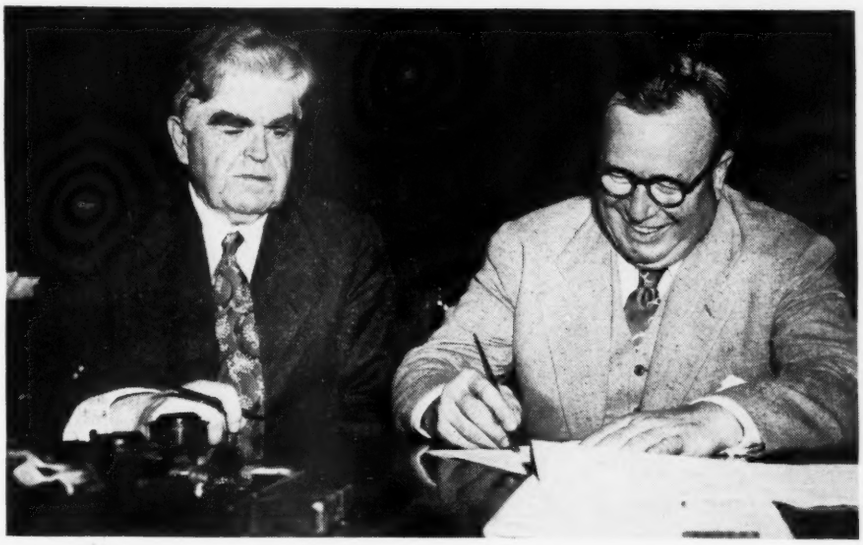
SINCE Jenkins Bros. 1864

JENKINS VALVES

Types, Sizes, Pressures, Metals for Every Need

News Round-Up





Wide World

AGREEMENT by Mr. Lewis and Mr. Moses halts strike as . . .

"Captive" Operators Sign Contract; Compromise on Union-Shop Issue

Over 50,000 striking miners in "captive" coal mines resumed work July 14 after steel-company negotiators and mine-union representatives reached a compromise on the union-shop clause in the new contract, which had been signed June 25 by commercial operators. Agreement came July 13 after private talks between both parties in the chambers of Judge T. Alan Goldsborough, who had docketed for the next day a hearing on an NLRB plea for an injunction to halt the walkout.

Announcement of the settlement was made by Judge Goldsborough, who had guided the conferences since July 9. The "captive" mine group, the judge declared, would sign the same contract accepted earlier by commercial operators. However, he pointed out, "there is a stipulation that the main issue as to whether or not the contract can contain a union-shop provision shall be carried to its conclusion before the National Labor Relations Board and appellate courts. The contract will be modified, if necessary, according to the last court's decision. The stipulation means that this litigation before me [the NLRB request for an injunction] will be disposed of without a trial. I am very happy about it." Both sides had been very co-operative and "were anxious to get rid of the litigation, as was the Court," the judge added.

The next day, July 14, David P. Findling, associate general counsel, NLRB, appeared before Judge Goldsborough to request leave to withdraw the board's petition for an injunction. The Court promptly granted the request, "without prejudice to a renewal of the petition should subsequent events require it."

At the end of the miners' annual vacation period July 8, striking "captive" miners were joined by some 35,000 commercial miners in a sympathy walkout, idling some mines in western Pennsylvania, northern West Virginia, Ohio and other scattered coal-producing areas. Harry M. Moses, negotiator for the steel companies, had refused to sign the new contract along with commercial operators on the grounds that the union shop was illegal unless favored by a majority of workers voting in an NLRB-conducted election. No such election has been held among coal miners because Mr. Lewis has refused to sign the non-Communist affidavit.

U. S. Engineer Sees Water Periling Anthracite Mines

Unless action is taken within the next five years, the Pennsylvania anthracite fields will be largely flooded within 15 years, said Simon H. Ash, engineer, U. S. Bureau of Mines, in an interview July 2. At least $100,000,000 is needed to save the industry from underground pools that gradually have been invading the mines for the last 50 years and to protect the livelihood of 1,500,000 persons in the area who are directly or indirectly dependent on the industry.

In this connection, Mr. Ash pointed out, the Bureau is preparing to start a two-year survey likely to cost about $500,000 to outline methods for controlling mine water, determining probable costs and proposing methods of financing the long-range work. In the past four years the Bureau has mapped 146 underground pools containing 87 billion gallons of water in the region.

Meanwhile, it was made known that an appropriation of $323,000 was included in the Bureau of Mines section of the Interior Department Appropriation bill for studying water and flood conditions in the anthracite region. This amount is part of a total of $396,100 for anthracite investigations. Originally, in the Fenton bill passed by the House of Representatives March 1, expenditures of $560,000 were authorized but it was decided to provide necessary funds currently and to request further funds if and when needed next year. Work is scheduled to start at an early date.

•

Lewis Asks Dewey to Oppose Taft-Hartley Act

Gov. Thomas E. Dewey of New York, Republican candidate for President, has been asked by John L. Lewis to take a stand for repeal of the Taft-Hartley Act even though it might mean scrapping the Wagner Act which the new law amended. Mr. Lewis' views were expressed in the U.M.W.A. *Journal* of July 15, which also praised Gov. Dewey for turning down a proposal for a New York state law modeled after the Taft-Hartley Act. "We believe that it (the proposal to repeal the Taft-Hartley Act) affords the biggest contribu-

ELECTRICAN BUILDS MODEL SHOVEL

A MODEL SHOVEL, patterned after the Bucyrus-Erie 100-B loader, in the No. 3 pit of the Fidelity mine, the United Electric Coal Cos., DuQuoin, Ill., has been built by Dick LeCompte, electrician. The model has an 18-in. boom, 8-in. racking sticks and a stainless steel bucket with four bronze teeth. Power to operate the miniature shovel is obtained by plugging into an ordinary electric-light socket, which feeds the current to a transformer and rectifier. Mr. LeCompte spent about 20 months of spare time putting the model together.

tion that Dewey can offer the people of the nation to restore democracy and free collective bargaining and promote peaceful labor relations," the *Journal* said.

•

Mine Tomb May Be Opened in August

Efforts to recover the bodies of 20 men entombed by an explosion in the straight Creek mine, Bell County, Ky., are being planned by the state Department of Mines and Minerals, according to A. D. Sisk, new department chief. A meeting will be held in Pineville late in July to discuss ways and means of recovering the bodies and to set a definite date for the start of operations. The last legislature appropriated $100,000 for the recovery operations. It is believed that fires that have blocked recovery work since the mine was sealed off two and a half years ago have finally died out.

Strip Tax Upheld by High Pennsylvania Court

The Pennsylvania Supreme Court July 7 upheld a 10c.-per-ton tax imposed on strip mining operations in Dunkard Township, Greene County. The township levied the tax last October to meet pay raises granted teachers. Authority to tax derives from action of the 1947 legislature, which empowered local political subdivisions to tax anything not already levied upon by the state. Opponents of the tax argued that the Dunkard Township levy violated the school code provision that a district may not make more than one tax levy in each year and that the coal produced by strip mining already had been taxed as real estate. The court held that a legitimate emergency had caused reopening of the school budget and that the double-taxation argument was invalid, the tax on coal in place being a property tax and the tax on extracted coal being an excise tax.

Bureau Gets More Funds for Mine Inspections

Congress has upped the appropriation for coal-mine inspections and investigations to $2,431,500 for the coming fiscal year, as compared with an appropriation of $1,875,000 for the year ended June 30. Bureau officials estimated that the larger funds will make it possible to employ 50 additional inspectors, increasing the staff to 250. The appropriation also provides for additional electrical and explosive engineers and safety instructors. "The increase will enable us to inspect the small coal mines employing less than 25 men, which we have been unable to do heretofore except in special cases," declared James Boyd, Bureau director. "We will also be able to reinspect some of the more dangerous of the larger mines oftener than before," he added.

Of major importance in the new appropriation is the sum of $300,000 set aside for investigations. Most of this fund, Bureau officials indicated, will go into a survey of coking coal reserves, mining operations and blending techniques.

•

Plans Shaped for Illinois Utilization Meeting

Changing fuel requirements, developments in heating, customer and employee relations and marketing and sales will be the themes of the Eighth Annual Conference on Coal Utilization at the University of Illinois, Urbana, Sept. 27-28. Principal speakers will include the following: J. A. Bottomley, Sahara Coal Co.; Ivan A. Given, editor, *Coal Age;* Dr. W. H. Voskuil, Illinois State Geological Survey; R. C. Milligan, combustion engineer, Crerar-Clinch Coal Co.; H. A. Bergdahl, manager of dealer sales, The Crane Co.; and research specialists of the university's College of Engineering, the Small Homes Council and the Engineering Experiment Station.

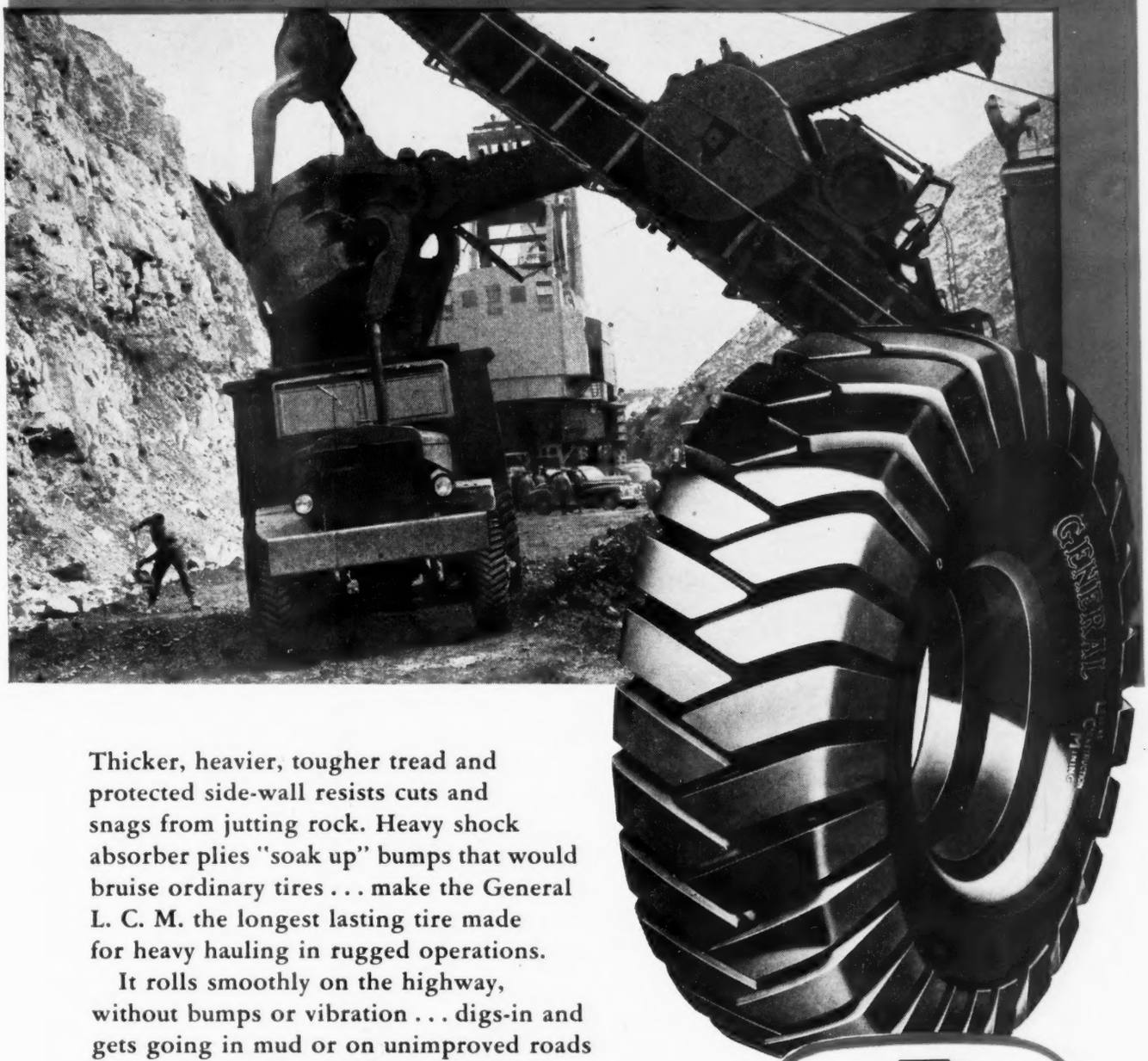
•

Co-op Mine Shuts Down As Owner—Miners Picket

Nearly 300 miners, all of whom are stockholders, struck the cooperatively owned Julian mine, Wheatland, Ind., in July when the Standard Coal Co. refused to recognize the union or sign a contract without an NLRB-conducted election to select a bargaining agent. The company has petitioned the NLRB for an election. Meanwhile, with production halted, stockholders found themselves, as members of the union, acting on their own employee-relations problems as representatives of both the union and the company.

WHEN YOU'RE CUTTING MINING COSTS
GET TIRES THAT STRIP BEDS CAN'T CUT!

THE GENERAL L.C.M.

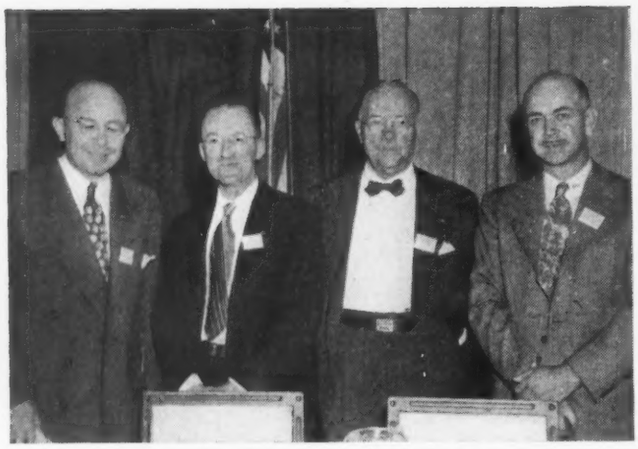


Thicker, heavier, tougher tread and protected side-wall resists cuts and snags from jutting rock. Heavy shock absorber plies "soak up" bumps that would bruise ordinary tires . . . make the General L. C. M. the longest lasting tire made for heavy hauling in rugged operations.

It rolls smoothly on the highway, without bumps or vibration . . . digs-in and gets going in mud or on unimproved roads . . . works equally well on front wheels, power wheels or free-rolling wheels.

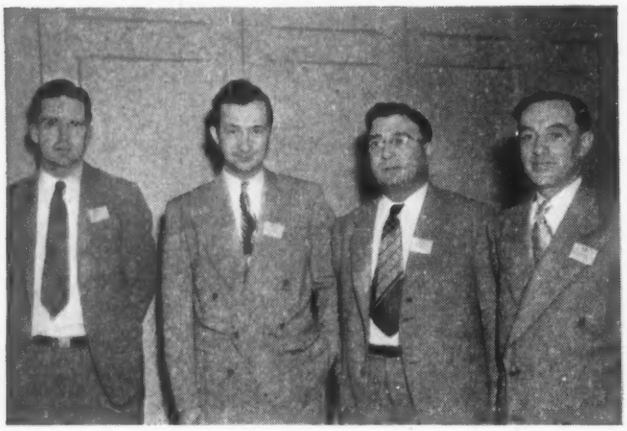
The GENERAL L.C.M.

THE GENERAL TIRE & RUBBER CO. • AKRON, OHIO

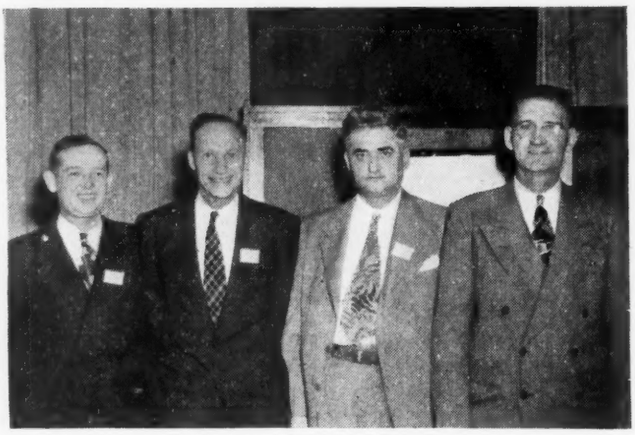


C. M. Schloss (left), Schloss & Shobart, program chairman; Robert A. Baxter, Colorado School of Mines; Fred W. Whiteside, consulting engineer and institute secretary-treasurer; and R. C. Oliver, president, Oliver Coal Co., and retiring institute president.

L. M. Cooley (left), general manager, Edna Coal Co., Oak Creek, Colo.; Joel N. Van Sant, safety engineer, St. Louis, Rocky Mountain & Pacific Co., Raton, N. M.; and W. L. Wearly, vice president for coal sales, Joy Mfg. Co.



Charles C. Boley (left), Natural Resources Research Institute, University of Wyoming; A. P. Cederlof, general manager, Peerless Sales Co., Salt Lake City; James Cassono, assistant general superintendent, Utah Fuel Co., Salt Lake City; and E. O. Jackson, superintendent, Independent Coal & Coke Co., Salt Lake City.



J. A. Setter (left), industrial engineer, General Electric Co., Denver, poses with N. F. Wetzel, Wetzel Equipment Agency, Salt Lake City; R. G. Gehlson, Mines Equipment Co., St. Louis; and Fred W. Koelling, superintendent, Phelps Dodge Corp., Dawson, N. M., and new institute president.

Production, Personnel and Utilization Themes of Rocky Mountain Meeting

COAL UTILIZATION, production, safety and engineering education were the major topics at the 44th meeting of the Rocky Mountain Coal Mining Institute, Denver, Colo., June 21-23. Fred W. Koelling, superintendent, Phelps Dodge Corp., Dawson, N. M., was elected president for the coming year, succeeding R. M. Oliver, president, Oliver Coal Co., Somerset, Colo. Resolutions adopted by the institute included one requesting immediate confirmation of Dr. James Boyd as director of the U. S. Bureau of Mines; another requesting the passage of a bill for expanding coal-research work at the Bureau of Mines Experiment Station at Golden, Colo.; and a third honoring Dan Harrington, who recently retired as head of the Bureau's Health and Safety Branch, and making him a life member of the institute.

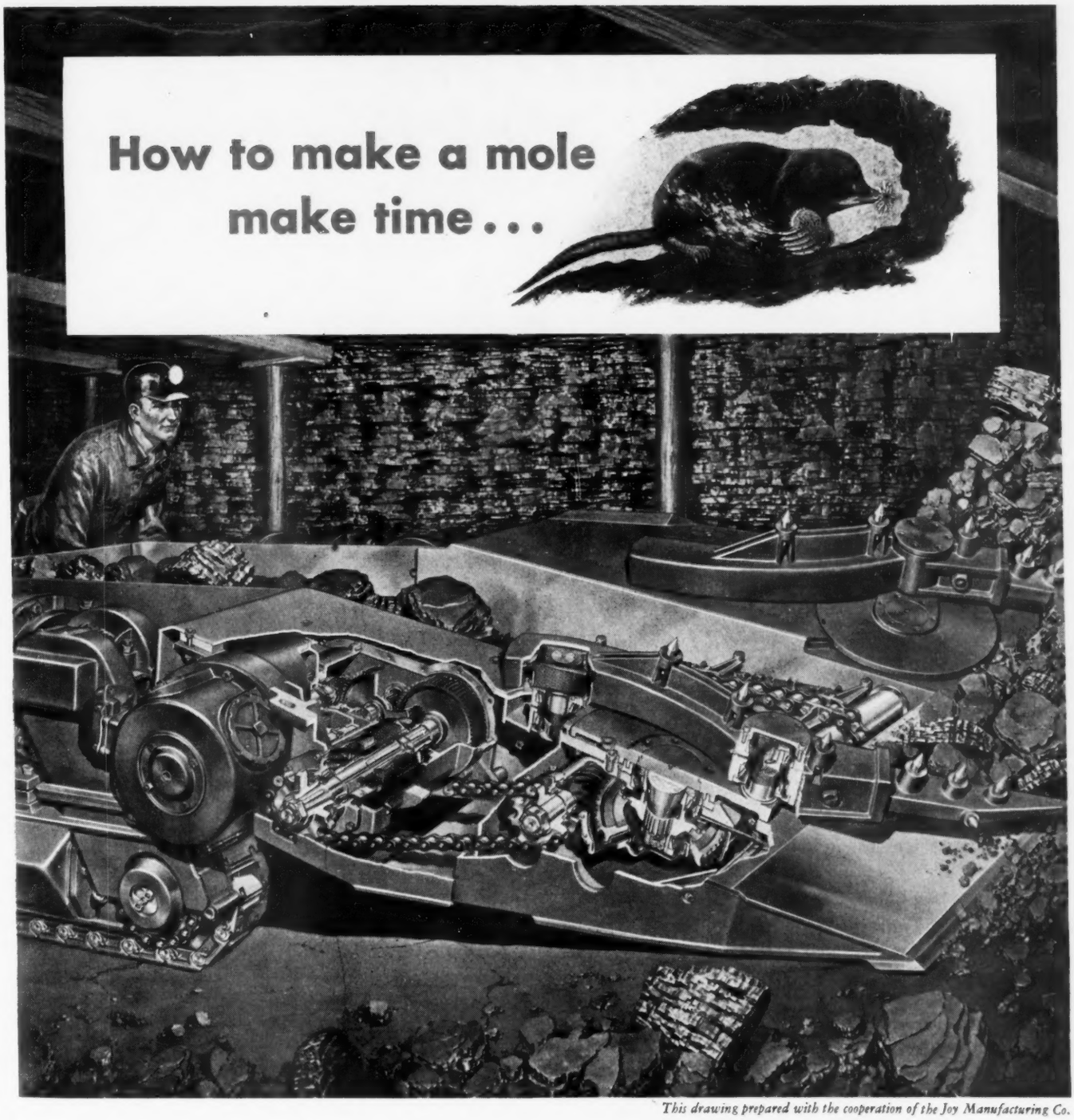
The history of the coal mining industry has been one of economic instability, with capacity and manpower exceeding requirements and, except for the period of the two World Wars, breeding intense internal competition plus controversy between management and men, declared Mr. Oliver in a review of the state of the industry opening the first technical session. As long as such a condition exists, with its accompanying violent fluctuations, including those of a seasonal nature, it will be difficult for the industry to adjust its operations on a truly economical basis.

In addition to internal competition, coal still has no market monopoly. Both oil and coal were short in the war picture, with some decrease in the competitive pressure, but oil, as well as coal, is working to increase production. Therefore, the present oil shortage does not mark the end of the competitive era. Coal, consequently, should adjust its thinking accordingly, as it still appears that without specific steps to promote markets, any increase to coal will come through greater energy use rather than an improvement in coal's competitive position.

Coal, Mr. Oliver declared, must meet the problems that still confront it as an industry and not producer against producer. Those problems still remain even though increased population is perhaps the brightest spot in the future.

One major problem is relations

How to make a mole make time . . .



This drawing prepared with the cooperation of the Joy Manufacturing Co.

Loaders Stay on the Job . . . with the Right Oils!

This modern coal loader is built to take punishment—and it gets plenty. The "mechanical brain" of the entire machine is the gathering head clutch. It knows enough to slip when loads become excessive.

Here's where oil plays a vital role. It must be heavy enough so the plates will slip when loads are dangerously high, and enough oil must cling to the clutch surfaces to protect against wear when slipping occurs. Yet it must be light enough so the plates will not slip under normal loads. A Gargoyle Vactra Oil meets these requirements.

On the gathering arm worm drive and bearings, the same special Gargoyle Vactra Oil helps resist shock loads and high pressures. Continuous, unbroken films reduce friction and wear.

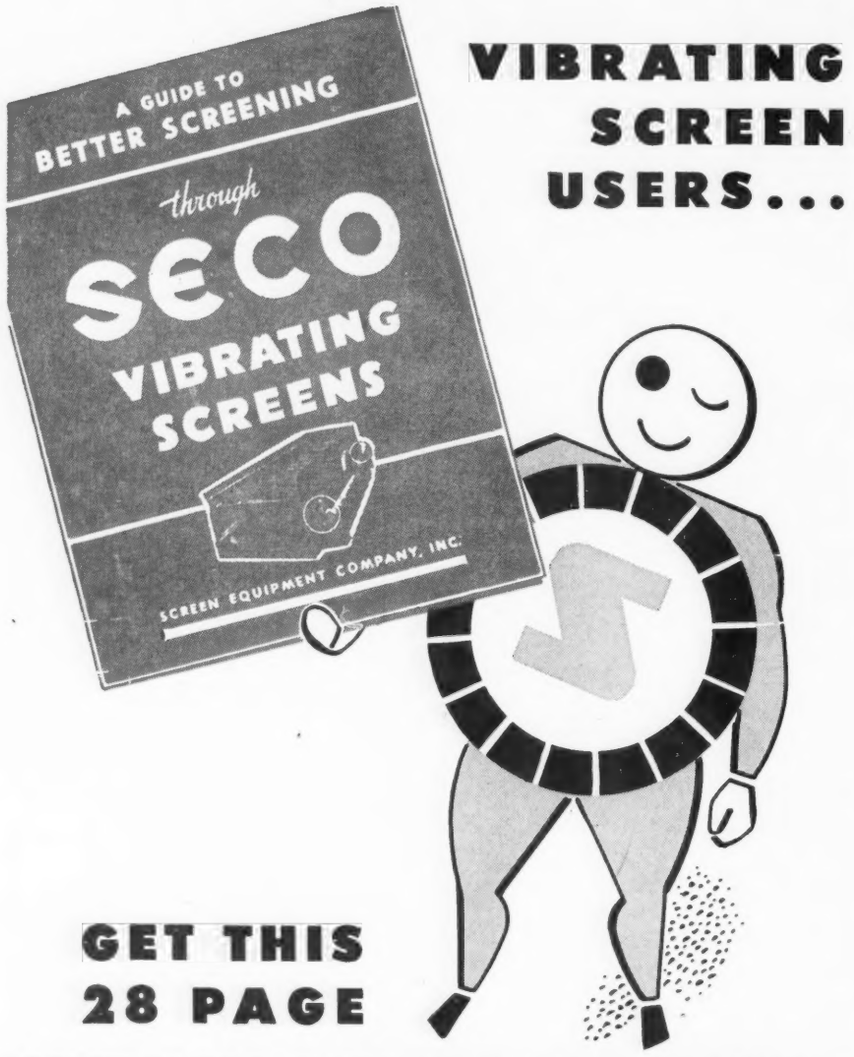
Socony-Vacuum

Correct Lubrication

SOCONY-VACUUM

GARGOYLE Lubricants

SOCONY-VACUUM OIL CO., INC., and Affiliates:
MAGNOLIA PETROLEUM CO., GENERAL PETROLEUM CORP.



VIBRATING SCREEN USERS...

GET THIS 28 PAGE

GUIDE TO BETTER SCREENING

Whether yours is a mining or stripping operation, you'll benefit by Seco's exclusive fully controlled true circular action. Seco builds over 250 models including single, double, triple and three and one-half deck types for sizing, dedusting or dewatering coal.

• *Mail this coupon today!*

● Please send me a copy of A Guide to Better Screening.

Name _____

Address _____

City _____

Dept. C A

SECO

SCREEN EQUIPMENT COMPANY, INC.
Buffalo 21, New York
In Canada: United Steel Corp., Ltd., Toronto

Rocky Mountain Officers

President—Fred W. Koelling, superintendent, Phelps Dodge Corp., Dawson, N. M. Mr. Koelling succeeded R. C. Oliver, president, Oliver Coal Co., Somerset, Colo.

Secretary - treasurer — Fred W. Whiteside, consulting engineer, Denver, Colo.

Vice presidents—Utah, Frank V. Hicks, general superintendent of mines, Geneva Steel Corp.; New Mexico, Joel N. Van Sant, safety engineer, St. Louis, Rocky Mountain & Pacific Co.; Wyoming, Julius Reuter, assistant superintendent, The Union Pacific Coal Co.; Colorado, W. J. Thompson, president, The Colorado & Utah Coal Co.

Executive board—Utah, James Cassano, Utah Fuel Co.; O. A. Troseth, Spring Canyon Coal Co.; New Mexico, John Garcia, inspector of mines; Andrew Gracie, St. Louis, Rocky Mountain & Pacific Co.; Wyoming, I. N. Bayless, The Union Pacific Coal Co.; D. H. Pape, Sheridan; Colorado, J. L. McBrayer, Colorado Fuel & Iron Corp.; Kirk V. Cammack, U. S. Geological Survey.

with labor. The western coal industry, Mr. Oliver contended, must, through a central organization, take a more active part in the negotiation of contracts and day-to-day relations with employees. Because small mines find it difficult to publish employee magazines and employ full-time personnel directors, the problem of conducting employee relations normally falls on the supervisory staff, particularly the mine foreman. The foreman is, of course, handicapped, as are the other officials who have other major duties. Consequently, the small operator is faced with the problem of coping with propaganda constantly directed at putting him in a bad light.

The answer is to supply the men with facts, including the fact that if miners are entitled to higher-than-average wages, the operator is entitled to a better-than-average return on substantial and somewhat risky investments. In the light of the prevailing situation, Mr. Oliver declared his belief that a general employee magazine for all the coal mines in the West was worthy of real consideration.

A second major problem is the wage differentials in mechanical mining. Every operation in the cycle is vital and the considerable differentials between the various ones are not reflected in benefits to the operation—nor the operator. A complete re-evaluation and re-classification of job standards and rates—not, however, by raising lower to higher—is a major industry need. Since it would do more than any other one thing to stabilize labor relations, the question should receive real attention.

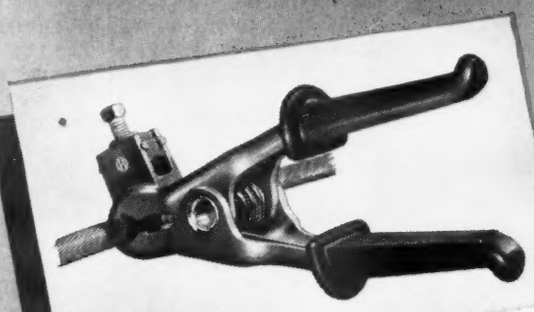
Coal offers both the operators and miners better opportunities in the fu-

Spending Dimes to Save Dollars!

Each dime you spend for O-B Fused Trolley Taps will safeguard many dollars of expensive cables, machine motors and production time. Cable burnouts cost money. So do motors damaged from overload. The simple fuse protection of an O-B Trolley Tap can prevent both. In addition, production shutdowns caused by burned out cables and overloaded motors will be eliminated.

Strong and ruggedly built, O-B Fused Trolley Taps have only four major parts—a fuse, two end terminals and an enclosing case. They weigh but slightly more than two pounds each and are available with four different types of wire attachment ends. Fuse ratings range from 3 to 400 amperes. If you are not already using O-B Fused Trolley Taps, order some today. The small price you pay is but a fraction of the value of the equipment they safeguard.

3833-H



TIGHT GRIP—Get good return circuit connections with O-B Plier-Type Ground Clamps

Provide perfect mechanical and electrical connections. Strong spring-kept jaws afford tight grip unaffected by twisting or vibration. May be attached to either bond cable, rail base or negative feeders as large as 1,000,000 cir. mil.

Ohio Brass

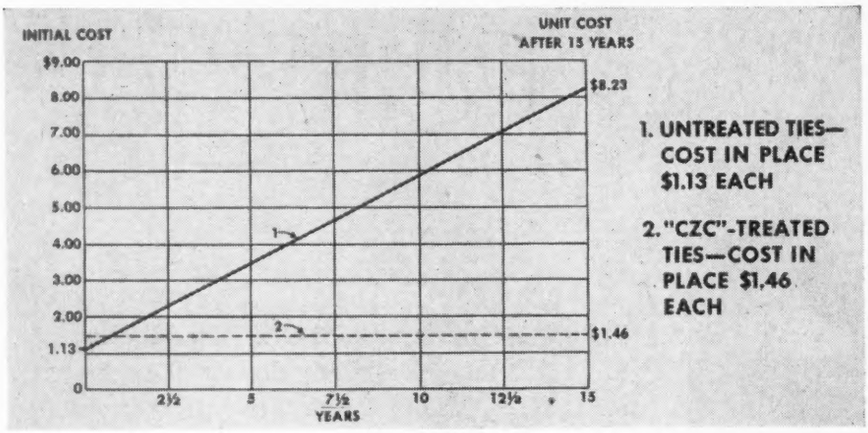
MANSFIELD, OHIO

Canadian Ohio Brass Co., Ltd., Niagara Falls, Ontario

"CZC"-

TREATED TIES COST LESS!

Compare the costs of treated and untreated ties over a period of 15 years!



The Chart Above shows why it pays to use "CZC"–treated ties and timbers. Figure it out:

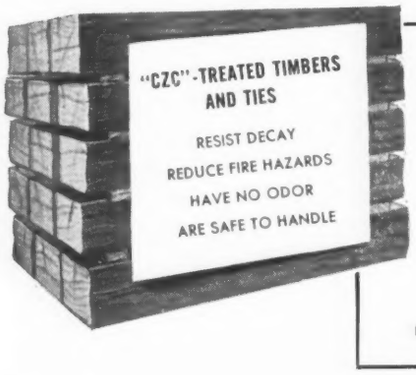
Assume an initial cost of 89¢ each for "CZC"–treated ties, and the initial cost of an untreated tie at 56¢. Total cost of installing an untreated tie—including delivery underground (estimated at 6¢) and labor cost for placing and spiking (at 51¢)—is $1.13. Using these same figures, the cost of installing a "CZC"–treated tie is $1.46.

Cost of Renewal High

The estimated life expectancy of an untreated tie is 2½ years, and the minimum life of a "CZC"–treated tie is 15 years. Therefore, the original untreated tie plus five renewals may be required to give the same life as a treated tie. The cost of laying a renewal tie, including spiking, removal and disposal of old ties, is estimated at 80¢ each.

Over a 15-year period, the cost of using untreated ties is $8.23 per unit, compared with $1.46 per unit for "CZC"–treated ties. The saving is even bigger if interest charges are applied on the investment.

For details write E. I. du Pont de Nemours & Co. (Inc.), Grasselli Chemicals Dept., Wilmington 98, Delaware.



DU PONT CZC

Chromated Zinc Chloride

WOOD PRESERVATIVE

DU PONT

REG. U. S. PAT. OFF.

BETTER THINGS FOR BETTER LIVING...*THROUGH CHEMISTRY*

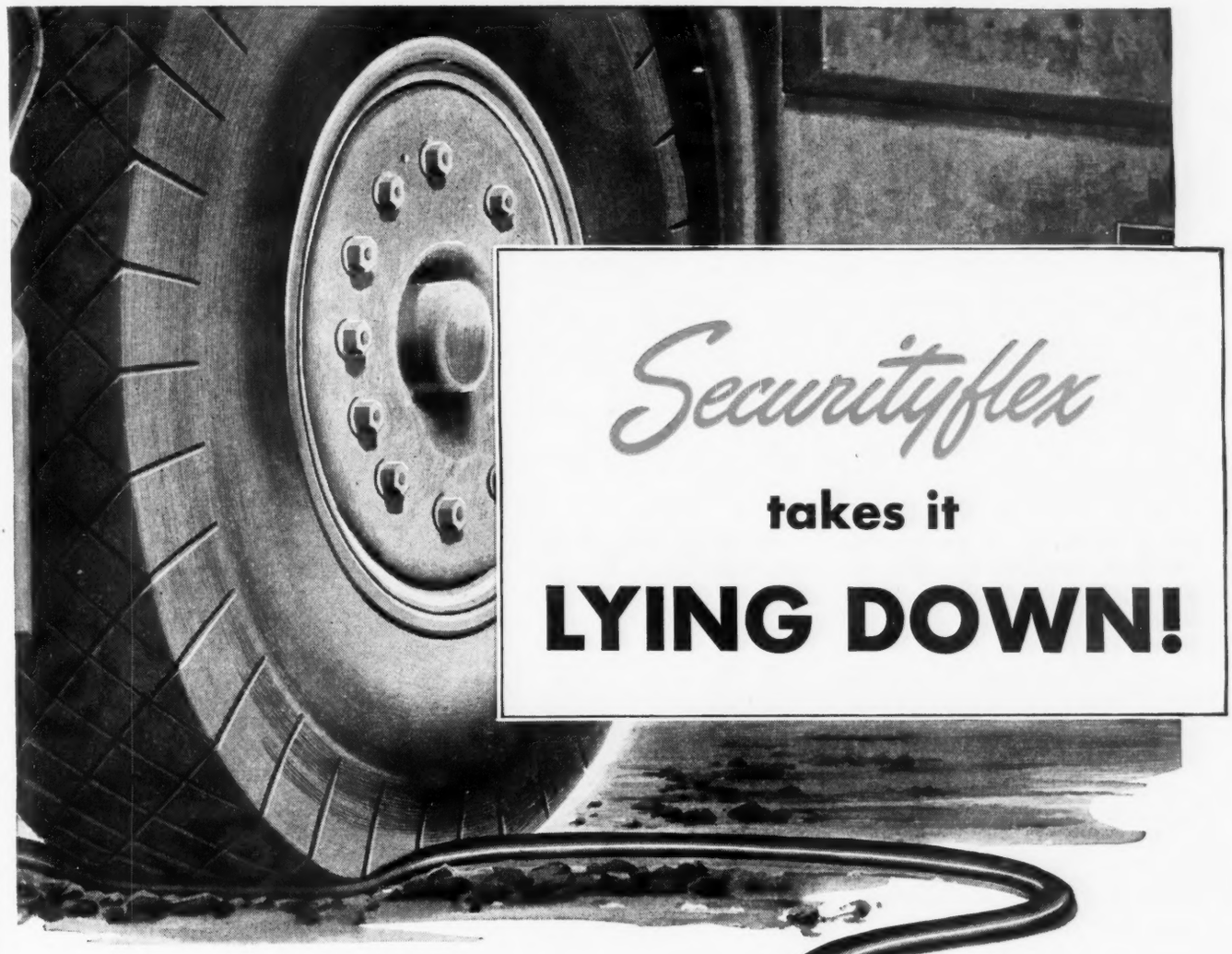
ture, Mr. Oliver concluded. To realize them, however, continuity of operation should be assured and there should be a realistic approach to the question of wages and the miner's contribution to mutual effort.

Agreeing with Mr. Oliver's conclusion that competition is a long way from through, D. H. Pape, Sheridan, Wyo., declared that the most important present point is what will coal do to help itself. Price is a major factor. Increases have stimulated competition. Prices, therefore must be reduced. This presents a real problem if the industry is to continue to pay high wages and show a good profit. Every possibility must be explored. Retailing offers one opportunity through reducing cost of yard operation and keeping margins within reason, thus holding off competition while still working a good profit. The dealer, Mr. Pape contended, must cooperate, and should embark on research directed toward lower-cost operation and consequent lower prices. Unless coal men get busy along this and other lines, trouble undoubtedly can be expected.

Education and training of engineers and supervisors at both the college and production levels was the second subject in the technical sessions. Discussion was opened by a paper on the proposed coal-mining curriculum at the Colorado School of Mines presented by Robert A. Baxter, associate professor of fuel and gas engineering, for himself and Clifton W. Livingston, professor of mining engineering, Colorado School of Mines, Golden, Colo. The paper was followed by discussion by Messrs. Oliver and Pape; Ivan A. Given, editor, *Coal Age;* Burt B. Brewster, editor, *Mining and Contracting Review,* Salt Lake City, Utah; Kirk V. Cammack, U. S. Geological Survey, Denver; Fred W. Whiteside, consulting engineer and institute secretary-treasurer, Denver; N. F. Wetzel, Wetzel Equipment Agency, Salt Lake City; Wilfred Kerr, Kerr Coal Co., Cameo, Colo.; W. L. Wearly, Joy Mfg. Co., Pittsburgh, and E. O. Jackson, Independent Coal & Coke Co., Kenilworth, Utah.

Discussion disclosed a deep interest not only in the education of engineers but in training of bosses and men. A major point was the necessity of coal companies getting behind a program to increase the supply of engineers, including active efforts to get promising men to take engineering, financial assistance to those needing it to enable them to complete their courses, willingness to provide opportunities to gain practical experience and willingness to make it worthwhile for men to take jobs in coal mining after graduation.

Engineering curriculums, it was brought out, should include courses leading to better ability in self-expression, whether writing or speaking, to a better understanding of human relations and to a better un-



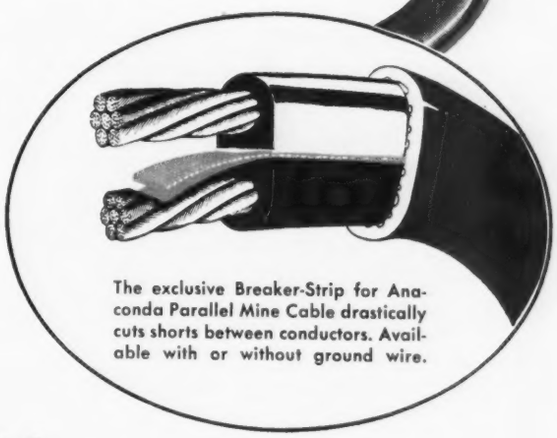
Securityflex takes it LYING DOWN!

THE ESTABLISHED LEADERSHIP of Securityflex* Parallel Mine Cable in the mining industry is the result of basic superiority in construction . . . and performance.

Anti-Short Breaker Strip between conductors cuts shorts to a minimum. Adhesion between jacket and insulation, by a special process, makes a *solid block* of heat resisting rubber and neoprene around conductors. Rugged, neoprene jacket resists flame and abrasion—cable meets all requirements of the Bureau of Mines Flame Test and diameter specifications. Will not kink, twist or tear.

The cable that can take it lying down, Securityflex, makes mines safer, more efficient. Just try it . . . you'll specify it from then on. 45409

*Trade-mark



The exclusive Breaker-Strip for Anaconda Parallel Mine Cable drastically cuts shorts between conductors. Available with or without ground wire.

ANACONDA Securityflex MINE CABLE ANACONDA from mine to consumer

Anaconda Wire & Cable Company, 25 Broadway, New York 4, N. Y.

I'M YOUR MAN

FOR TRIPLE SAVINGS
... AND THE *NEW*
"VIC-GROOVER"!

VICTAULIC COUPLINGS give piping systems a *flexibility* that minimizes bends and fittings . . . keep every joint *leak-tight* under pressure or vacuum... make joints *positive-locked* so they can't blow off or pull out under vibration or sag.

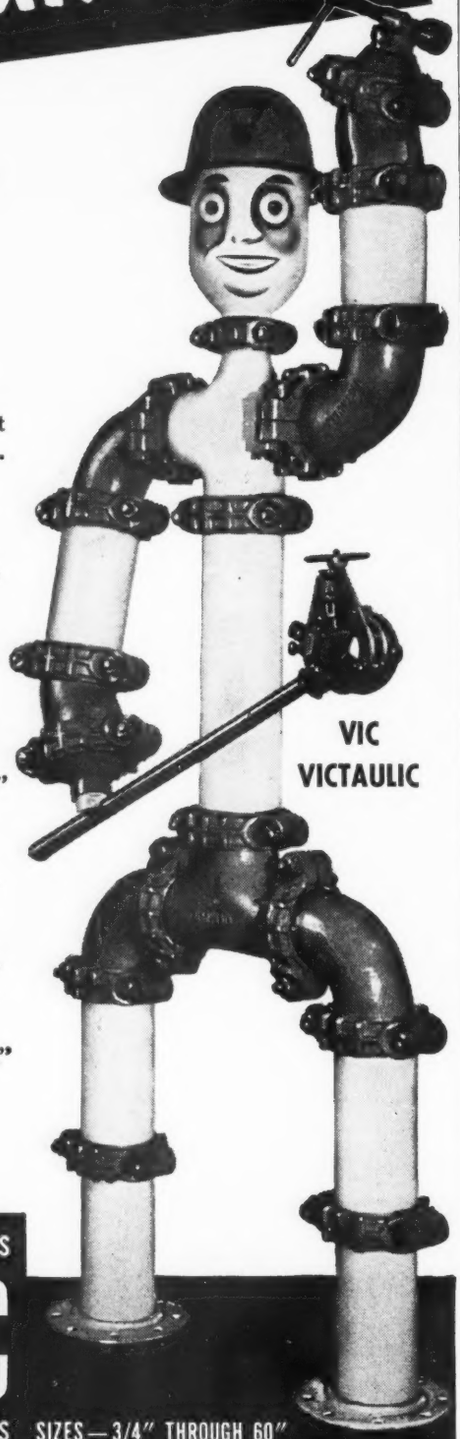
JUST A FEW TWIRLS of a T-wrench buttons up a Victaulic system...or unbuttons it—with no special skill or training needed!

THIS SAVES YOU money, man-hours, material...in assembly, repair, or salvage!

AND NOW! A new "VIC-GROOVER" grooves pipe ends automatically and twice as fast...with half the effort of ordinary pipe threaders.

FOR FULL ECONOMY, make your piping system *ALL*-Victaulic—with Victaulic Couplings and Victaulic Full-Flow Elbows, Tees, and other Fittings ...and the new "VIC-GROOVER"!

Write today for new "VIC-GROOVER" Catalog VG-47...and also ask for Victaulic Catalog and Engineering Manual No. 44.



SELF-ALIGNING PIPE COUPLINGS

VICTAULIC

EFFICIENT FULL FLOW FITTINGS SIZES—3/4" THROUGH 60"

VICTAULIC COMPANY OF AMERICA
30 ROCKEFELLER PLAZA, NEW YORK 20, N. Y.

Victaulic, Inc., 727 W. 7th St., Los Angeles 14, Calif.
Victaulic Company of Canada, Ltd., 200 Bay St., Toronto 1
For export outside U. S. and Canada: PIPECO Couplings and Fittings:
Pipe Couplings, Inc., 30 Rockefeller Plaza, New York 20, N. Y.

Copyright 1948, by Victaulic Co. of America

derstanding of the place of the industry in the national economic picture. The technical subjects, such as mathematics, some speakers emphasized, should be related more closely to industry operations, and opportunity should be provided for practical experience, including an opportunity to find out what a day's work is for an employee.

The need for more training for supervisory and machine operating jobs was emphasized, along with the need for more engineering and managerial talent. It also was pointed out that many miners are showing a real desire to learn more about operation of their equipment, its maintenance and mining in general. Special courses to prepare men for bossing jobs and to enable men already in such work to do a better job have proved their value in some sections, such as Carbon County, Utah. Corresponding courses in machine operation and maintenance have likewise shown their worth in West Virginia and elsewhere, it also was brought out.

With A. P. Cederlof, general manager, Peerless Sales Co., Salt Lake City, presiding, Charles C. Boley, Natural Resources Research Institute, University of Wyoming, opened the second session with an account of progress and planning in drying and briquetting high-moisture western coals. Pointing to the need for information on shortage and burning characteristics, as well as to the possibilities of using char for gasification and synthetic-liquid-fuel production, Dr. Boley outlined the benefits to the industry that would result if expanded facilities could be made available.

Pointing out that interest in developing the area is increasing and that the area lends itself to the development of stripping and large new deep mines, N. W. Bass, regional geologist, U. S. Dept. of the Interior, Denver, reported on the geology of the Yampa coal field of Routt County.

Basing his paper on experience gained in liberating and operating the properties for the Solid Fuels Section of SHAEF in 1944, James Cassano, assistant general superintendent, Utah Fuel Co., Sunnyside, Utah, outlined the geology of the region and the mining practices employed in the Moselle region of France at that time. Supplementing his discussion, J. H. East Jr., U. S. Bureau of Mines, Denver, talked briefly on conditions in a number of European countries, particularly those along the Mediterranean.

Airdox coal-breaking at the Koehler and Brilliant mines of the St. Louis, Rocky Mountain & Pacific Co., Raton, N. M., was the subject of a paper by Joel N. Van Sant, safety engineer, concluding the second technical session. Airdox was first installed at Koehler because it was the only breaking medium permitted on shift and because of its safety features, Mr. Van Sant pointed out. Since the elevation at Koehler is 7,000 ft., two

The Kennametal Rock Bit

New through and through

The Masterpiece of Modern Rock Bit Construction . . . Now Ready to Bring You Great Performance

The completely new Kennametal Rock Bit is here. It's now ready to give you greater performance, to show you big overall savings in drilling cost, and to offer increased drilling speeds in the hardest rock you drill.

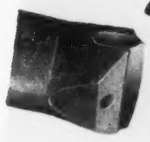
The Kennametal Rock Bit can be used on hand-held drills, stopers, drifters, or wagon drills without a single conversion. Performance records in many mines show that quartzite, granites, hard limes, sandstone, and other similar rocks are drilled 20 to 30 per cent faster and the bit stays sharp up to 100 times as long. The same size Kennametal Rock Bit drills holes to their full depth. It eliminates bit changes due to gage reduction because gage losses are in thousandths of an inch.

The blade or cutting edge is solid Kennametal, the metal that is nearly as hard as the diamond. It resists wear and abrasion, and it takes the constant hammering stresses of drilling in hard, tough, solid rock without failing.

The Kennametal Rock Bit has the exclusive feature of mechanical blade holding which increases bit life, lowers bit cost, and gives longer, better service.

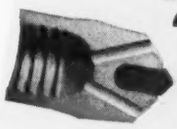
Sizes are 1⅜", 1½", 1⅝", 1¾", 2", and 2¼".

Write for complete information today.



New Mechanical Blade Mounting

Mechanical blade holding is an exclusive Kennametal Rock Bit feature that eliminates stresses in the cutting edge of the bit . . . gives it longer life.



New Stress Flow Construction

"Stress Flow" applies ideally to the way the Kennametal Rock Bit is designed to handle stress action in the bit body. A big advantage for increasing bit performance and reducing bit cost.

New Super-Tough Steel Body

Special steel is used to back up the hard, long-wearing Kennametal insert so the bit will give longer service, drill better.

New Threaded Connection

Kennametal Rock Bits screw on F, H, and D threaded drill rods. And the bit can be used on heavy or light machines. No conversions are necessary to use the bit.

KENNAMETAL

The World's Largest Manufacturer of Cemented Carbide Mining and Drilling Tools

Mining Division—KENNAMETAL Inc., Latrobe, Pa.

It is *Completely* Proved

HIGHLY PROFITABLE MAGNET OPERATION*

"Several months ago we installed one of your RECTANGULAR SUSPENDED MAGNETS ahead of one of our Launder Baum Jig combination washers and have found this magnet installation not only satisfactory in removing tramp iron from the raw coal, but it has been highly profitable in the salvaging of material which can be readily returned to the mines and reused.

"We are so enthusiastic over the performance of this magnet that we have purchased six more for delivery in the near future.

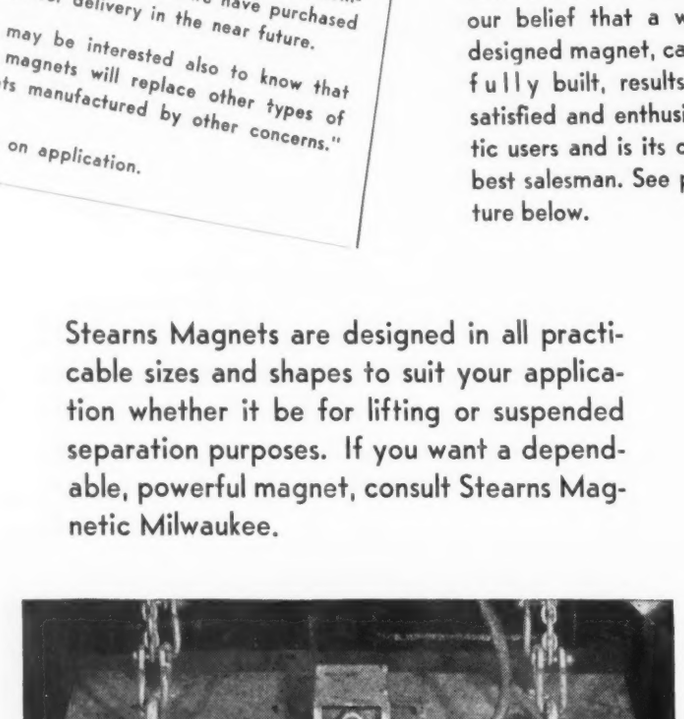
"You may be interested also to know that these magnets will replace other types of magnets manufactured by other concerns."

*Name on application.

OUR Customer WROTE This AD

Letters like this confirm our belief that a well designed magnet, carefully built, results in satisfied and enthusiastic users and is its own best salesman. See picture below.

Stearns Magnets are designed in all practicable sizes and shapes to suit your application whether it be for lifting or suspended separation purposes. If you want a dependable, powerful magnet, consult Stearns Magnetic Milwaukee.



Stearns SEPARATORS • ROLLS • DRUMS CLUTCHES • BRAKES • SPECIAL MAGNETS

MAGNETIC MFG. CO.

661 S. 28th St., Milwaukee 4, Wis.

compressors were required to supply air for the breaking units. Average production is 1,600 tons per day. In addition to the two working compressors, a third standby unit also was installed. Air is taken into the mine through steel lines with an outside diameter of 1 in. and an inside diameter of ⅝ in. From the steel main, copper tubing (⅜ in. outside, 7/40 in. inside) conducts the air to the working faces.

Because of the nature of the coal seam, it was necessary to increase drill size from 2 to 3½ hp. at Koehler to handle the drilling load growing out of the increase in hole size. At Brilliant, however, the 2-hp. machines were able to handle the larger holes and still keep up. A drill crew averages 40 holes a Shift at Koehler. One to three additional holes per face are required at Koehler, while at Brilliant there was no increase as compared to shooting with powder.

"A fall of coal broken by Airdox provides excellent loading conditions for the Joy operator. The coal, when broken, seldom falls more than a few feet outby the original position of the face. The decrease in amount of fines cuts down dust and water for sprinkling. Picking coal off the face and ribs is practically eliminated. Generally, the coal will break to the rib and roof line within half the diameter of the borehole. Also, the coal will be pulled approximately to the end of the shell position in the borehole, leaving from 1 to 4 in. of borehole in the solid face. Shattering of the roof, rib and face is not experienced as in powder shooting, resulting in clean-cut solid ribs and roof easy to timber and maintain."

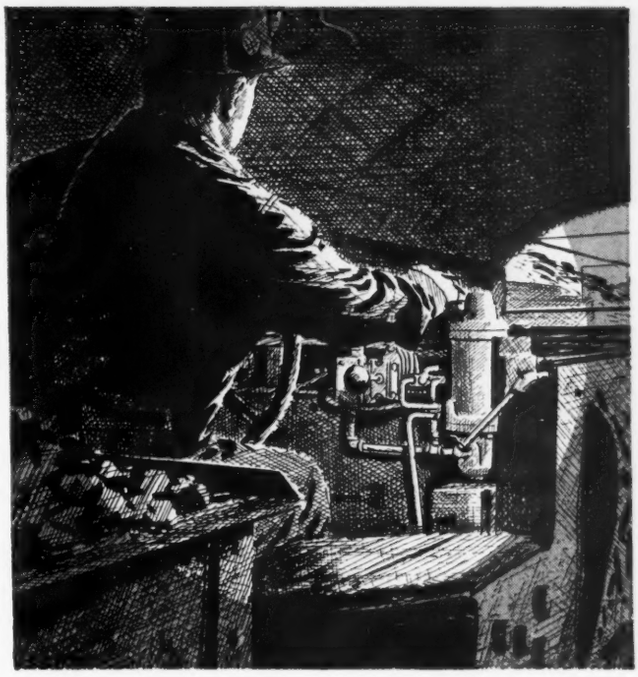
Before Airdox was adopted, said Mr. Van Sant, 12 to 14 places were required to permit a Joy to operate two shifts. Now, the number has been reduced to 4 to 6 and efficiency has increased through the following advantages provided by concentration; less initial timbering, tracklaying, water-line and wiring and their maintenance; less area exposed for roof falls and squeezing, faster and safer pillar extraction, reduced haulage distance and lower cost for rock-dust distribution. Secondary advantages include ability to re-break an improperly prepared place on shift, rock dusting by discharging a tube into two bags of dust and fast, low-cost brushing of top and bottom where required.

Mountain-top stripping at the Edna mine in Routt County, Colorado, was described by L. M. Cooley, general manager, Edna Coal Co., Denver, to open the third technical session, which was preceded by a motion picture on belt-conveyor haulage presented by the Goodyear Tire & Rubber Co. Discussing briefly various types of strip mining, Mr. Cooley then described equipment and methods at the Edna Mine (*Coal Age*, November, 1947, p. 96).

Declaring that shuttle cars offer

Putting WESTINGHOUSE BRAKES on your locomotives

Puts the brakes on maintenance too



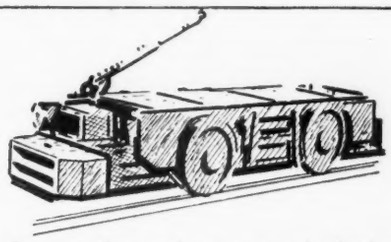
One of the most important steps in any high-speed haulage program is the installation of *dependable power brakes* . . . and it's an important step in maintenance-control programs, too.

Westinghouse brakes mean greater safety in controlling trips, higher allowable speeds, and quicker, more-accurate stops. And in addition, they bring substantial savings in locomotive maintenance that soon pay for the brake investment.

One user reported that the use of power brakes had increased brake shoe life from one week to three months and decreased wheel turning 50%. Less sand was required, and better rail contact cut power loss and overheating.

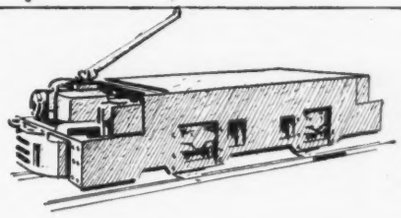
Motor bucking to check speed or stop was entirely eliminated, with a consequent saving in repairs and replacements of split motor pinions, broken axles and armature shafts, and loosened coils.

For *Light* Locomotives



For smaller locomotives where space is limited, Westinghouse Hydraulic Brake Equipment provides a complete, practical answer to power brake needs. Rugged, husky parts are small and compact, can be easily fitted into available space. Installation can be handled when unit is in shop for overhaul.

For *Heavy* Locomotives

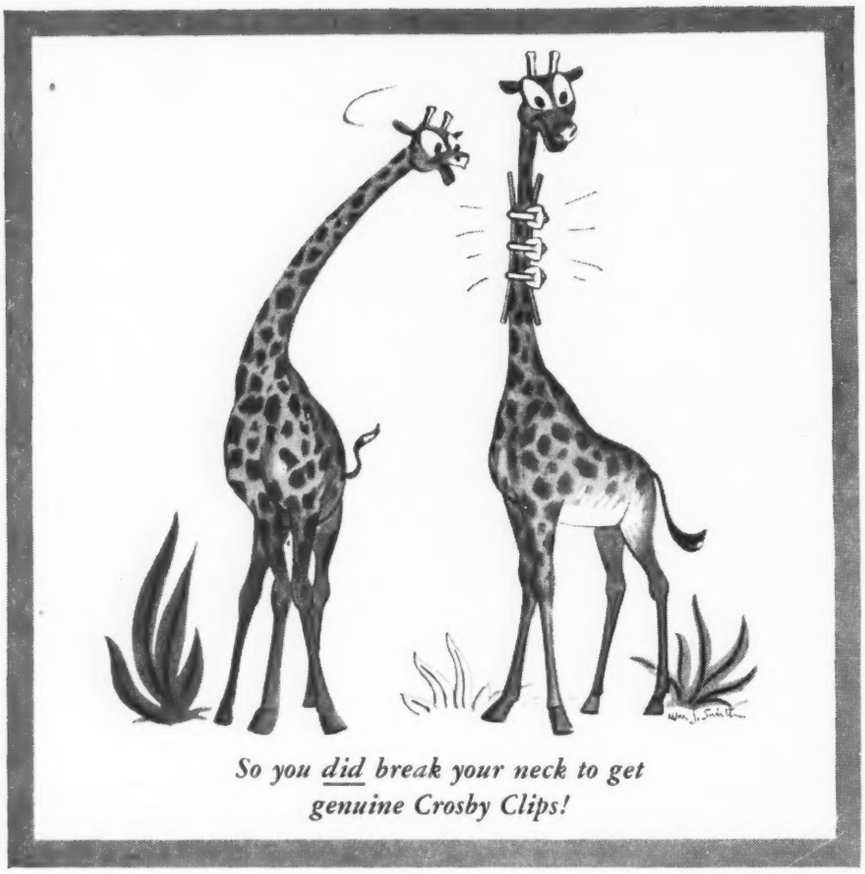


On larger, heavier locomotives used for long hauls with heavy trips, where space is available for compressor and tank, Westinghouse Air Brake Equipment is recommended. It reflects the engineering and workmanship that has safeguarded railroad travel for over three-quarters of a century.

Ask for information on power brakes—air or hydraulic—for your locomotives.

WESTINGHOUSE AIR BRAKE COMPANY

INDUSTRIAL DIVISION WILMERDING, PENNSYLVANIA



So you did break your neck to get genuine Crosby Clips!

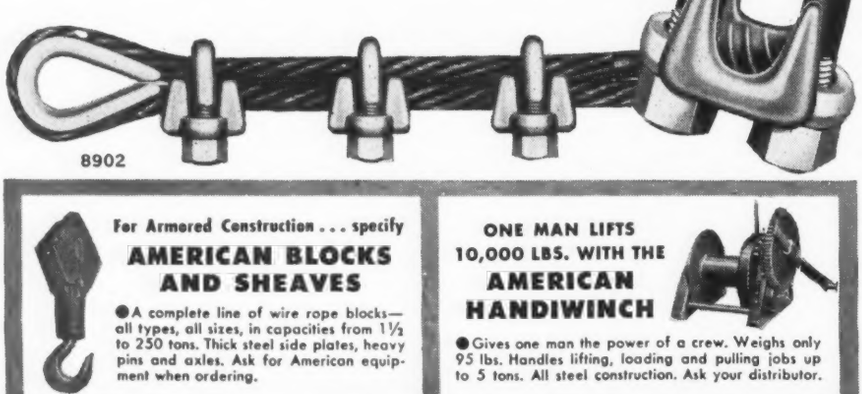
Why stick your neck out, in buying wire rope fasteners? The difference in cost between genuine CROSBY CLIPS and the cheapest fasteners you can buy is certainly not much of an item. CROSBY CLIPS are *drop-forged*—not cast. Channel grooved base, high side wings, chamfered bolt ends, are priceless features of quality. Sold by distributors everywhere, in sizes from ⅛" to 3".

Made only by AMERICAN HOIST & Derrick Co., St. Paul 1, Minnesota.

Industry uses more

CROSBY CLIPS

than all other drop-forged fasteners



For Armored Construction . . . specify

AMERICAN BLOCKS AND SHEAVES

● A complete line of wire rope blocks—all types, all sizes, in capacities from 1½ to 250 tons. Thick steel side plates, heavy pins and axles. Ask for American equipment when ordering.

ONE MAN LIFTS 10,000 LBS. WITH THE AMERICAN HANDIWINCH

● Gives one man the power of a crew. Weighs only 95 lbs. Handles lifting, loading and pulling jobs up to 5 tons. All steel construction. Ask your distributor.

the best means of achieving maximum production from loading machines, W. L. Wearly, vice president for coal sales, Joy Mfg. Co., Pittsburgh, analyzed the problems involved in shuttle-car loading into belt conveyors. Belts behind shuttle cars, Mr. Wearly stated, eliminate the "no-empties" excuse for poor service, reduce the non-productive labor otherwise involved in tracklaying and locomotive operation and permit loaders to reach the maximum efficiency, in addition to facilitating getting in and out before roof trouble can become serious.

Using examples to point up his conclusions, Mr. Wearly offered the following as major factors in belt selection: the shuttle-car discharge rate, number of shuttle-car trips per shift, number of cars discharging to the belt, number of gathering belts per main-line unit and, where main-line units are employed, the possibilities of using automatic flow-limiting devices. Physical conditions to be considered include seam height, length of haul from the face to the belt, the mining layout in all its phases and the maximum sizing of the lumps produced.

Among other things, Mr. Wearly brought out that if the same size of belt is to be employed, it must be speeded up or an intermediate unit must be installed to handle a big straight-discharge car. Use of the elevating-type car slows down the discharge and may permit use of a smaller belt or a lower speed. Where multiple-car installations are made, auxiliary feeding conveyors usually are necessary to prevent overloading the belt and permit use of a smaller unit or operation at reasonable speeds. Where big lumps are produced, it must be assumed at the start that a 36-in. belt must be installed unless preparation is revised to reduce lump production. However, development of 42-in. belts knocking down into more and light parts, thus easing the moving problem, offers the possibility of another solution to the lump problem.

Reporting on experience with shuttle cars loading onto belts at Standard Coal, Inc., Spring Canyon, Utah. (*Coal Age*, Sept. 1947, p. 82), C. Arthur Carlson, general superintendent, declared that large lumps naturally have presented difficulties but that the belt is doing an excellent job, handles the coal nicely and saves labor. A fixed chute receives the coal from the shuttle cars and feeds it onto the belt in the direction of travel, materially reducing scuffing. Supplementing Mr. Carlson's remarks, Mr. Wearly declared that the problem of discharge chutes is an important one and must receive thorough consideration in any belt set-up.

Comparing production of synthetic liquid fuels and chemicals from coal by both the hydrogenation and Fischer-Tropsch processes, L. L. Hirst, chief, coal to oil demonstration

MAKES MORE $ FOR MORE MINES

than any other kind

The largest selling bits for use with mechanical coal cutting machines are Bowdil Bits. Such popularity is deserved by performance, long life and low cost operation in a growing list of mines throughout the world.

Made of special alloy steel and heat treated by the most modern methods to hardnesses best suited to your cutting conditions, Bowdil Bits are available in special shapes, cutting face contours and clearance angles to fit your needs.

A nearby Bowdil Service Man or Representative will be pleased to give you further information. Write for our latest bulletins on Bowdil Mining products.

BOWDIL

COAL CUTTING EQUIPMENT

CANTON OHIO

IN THIS ERA OF RISING COSTS

WHY LET "HAND PICKING" OFFSET THE ECONOMIES OF MECHANIZATION?

Full-seam mechanized mining is unquestionably the lowest cost way to deliver maximum tonnage to the tipple. But the very machines and methods that cut costs underground also send up a large and variable percentage of refuse to the preparation plant.

Today, any preparation process which cannot continuously and automatically remove these fluctuating quantities of rock, draw slate, bone, etc. from feed and produce a specification fuel without hand picking is as obsolete and inefficient as pick mining, hand loading, tramway mules or "breaker boys".

Today, many authorities calculate, the wages of each "hand picker" justify a capital investment of $25,000 in precision cleaning processes, such as Heavy-Media Separation or the Dutch State Mines Cyclone Separator.

With these *Separation Processes by Gravity Difference* available for new cleaning plants or as adjuncts to present breakers, it is no longer necessary to compromise on quality or to do hand picking. Now you can fit the cleaning process to your markets . . . with full knowledge that no other process or equipment can produce cleaner coal at lower cost.

With a process for every size and specification, and no self-interest in equipment manufacture or plant construction, Cyanamid offers unprejudiced counsel on coal cleaning based on tests of your coal by various preparation processes in the Cyanamid Mineral Dressing Laboratory at Stamford, Connecticut. We invite discussion and stand ready to run carload tests on your coal; to cooperate with engineers of your choice in the design of the most efficient separation units into your cleaning plant, and to provide the assistance of Cyanamid Field Engineers in tuning up the installation.

SEPARATION PROCESSES BY GRAVITY DIFFERENCE

DUTCH STATE MINES CYCLONE SEPARATOR

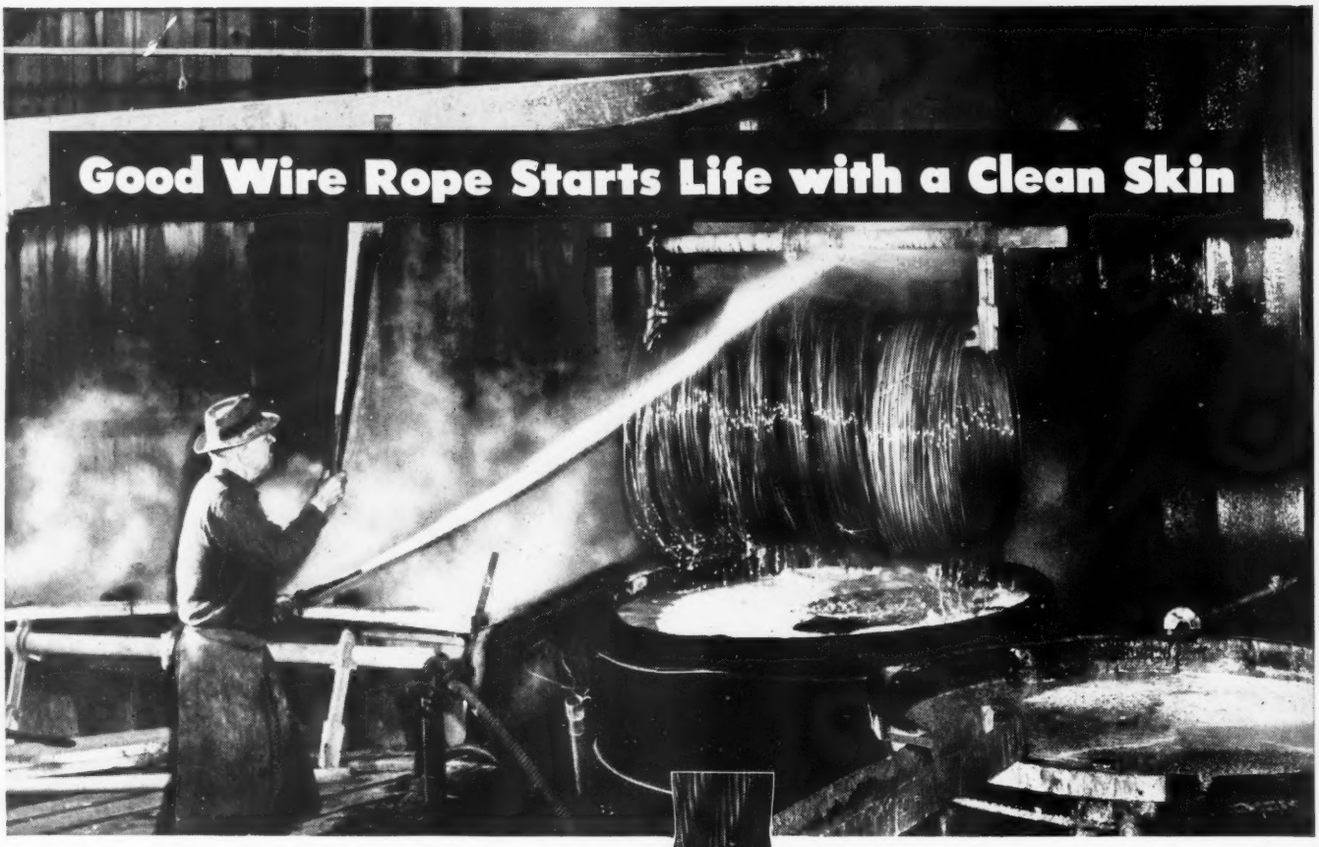
Unique processes which promise important additions to the technology of coal preparation by gravity difference in the size range ¼" x 0, on either anthracite or bituminous. Small size, unusual capacity and utter simplicity of the separating equipment and its ingenious utilization of centrifugal and centripetal forces are inherent advantages. Uses low-cost magnetic medium, with provision for continuous, automatic medium recovery. Commercial size, continuous unit "cyclone" for testing carload lots now in operation in the Cyanamid Mineral Dressing Laboratory. Considerable test data have been accumulated and results are available to those interested.

HEAVY-MEDIA SEPARATION

Precision cleaning over a full-size range with inherent advantages over previous preparation methods in cleaning coal with a high-percentage of near-gravity material. Extremely accurate on coal with a high and variable percentage of refuse. Functions efficiently at any desired gravity from 1.25 to 3.40 (within ± 0.01) with gravity quickly and easily adjustable as feed-coal changes. Low medium loss because of continuous, automatic recovery of medium. Plants can be designed for multiple-product separation from run-of-mine feed in a full-size range to meet any present or future specification in any market. Equipment is standard and time-proved. Plants can be started or shut down without bank-loss of coal or medium or change in plant efficiency. Labor costs are low.

AMERICAN Cyanamid COMPANY

30 ROCKEFELLER PLAZA, NEW YORK 20, N.Y.



Good Wire Rope Starts Life with a Clean Skin

Because scale is extremely detrimental to good wire drawing, every coil of rod that enters Wickwire's Rope Mill is thoroughly cleaned in a carefully prepared bath —with temperature thermostatically controlled and with acidity checked and recorded at frequent, regular intervals. Then the rods are sprayed with a high pressure hose to remove all traces of acid and scale, dipped in "bath salts," lime-coated, baked, and sent to be drawn into wire.

Thorough cleaning is only one small step in the quality control of Wickwire Rope manufacture—but we at Wickwire believe that *every* step is important to assure finished rope that will stand rugged service—in oil fields, logging and construction camps, shipyards, mines, mills and skyscrapers. Wickwire distributors and rope engineers in key cities everywhere are ready to help solve your wire rope problems and to supply the type of rope that best meets your requirements.

For the utmost in performance, safety and long life, specify Wickwire Rope. Available for prompt delivery in all sizes and constructions, both regular lay and WISSCOLAY *Pre*formed.

THIS 82-PAGE BOOK ON WIRE ROPE IS FREE WRITE FOR YOUR COPY TODAY!

Thousands of wire rope users have found that the information packed in the pages of "Know Your Ropes" has made their work easier. It's full of suggestions on proper selection, application and usage of wire rope. It's easy-to-read and profusely illustrated. For your free copy, write—Wire Rope Sales Office, Wickwire Spencer Steel, Palmer, Mass.

WICKWIRE ROPE

CF&I & SUBSIDIARIES

A PRODUCT OF THE WICKWIRE SPENCER STEEL DIVISION OF THE COLORADO FUEL AND IRON CORPORATION

WIRE ROPE SALES OFFICE AND PLANT—Palmer, Mass. **EXECUTIVE OFFICE**—500 Fifth Avenue, New York 18, N. Y.

SALES OFFICES—Abilene (Tex.) • Boston • Buffalo • Chattanooga • Chicago • Denver • Detroit • Emlenton (Pa.) • Philadelphia • Tulsa • Fort Worth • Houston • New York

PACIFIC COAST SUBSIDIARY—The California Wire Cloth Corporation, Oakland 6, California

EASIER TO SEE...SAFER TO USE

U.S. Royal Gold Cables

These mine trailing cables have a golden yellow color, for high visibility. They provide new highs in safety —without loss in efficiency.

The jacket is made of tough *pressure-cured* Neoprene —highly resistant to abrasion, cutting, heat, moisture, and oil. Beneath the jacket, a strong cotton braid covers the insulation.

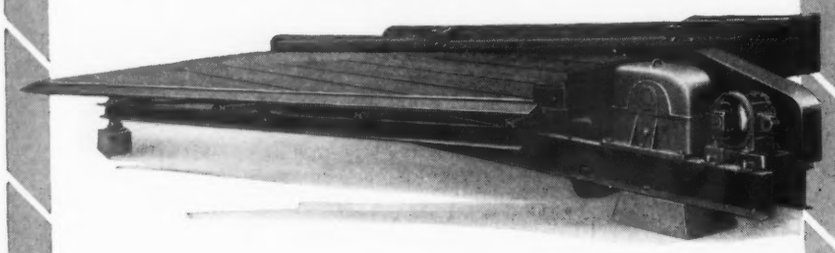
The insulation itself is the finest rubber compound, with a tensile strength as high as 1400 pounds per sq. in. Conductors are of annealed coated copper, the stranding of which is designed specifically for mine trailing cables.

U.S. Royal Gold Cables are approved as tough enough for your roughest jobs only after they have passed seven gruelling "torture" tests. They are approved as flame-resistant by the Pennsylvania Department of Mines. ALL U. S. ROYAL MINING MACHINE AND LOCOMOTIVE CABLES ARE AVAILABLE IN BLACK OR NEW GOLDEN YELLOW. Write today for free sample to United States Rubber Company, Wire and Cable Department, 1230 Avenue of the Americas, New York 20, N. Y.

APPROVED AS FLAME-RESISTANT

BY THE PENNSYLVANIA DEPARTMENT OF MINES

SuperDuty OUTPERFORMS ANY OTHER COAL WASHING PROCESS



SuperDuty Diagonal Deck Coal Washing Tables remove impurities from the fine sizes easier and with greater efficiency than is possible by any other process.

With comparative ease, the SuperDuty thoroughly cleans from 5 to 25 tons per hour, depending upon the characteristics of the coal. This table's efficiency accounts for recovery of 98% or better of float coal available in the feed.

No other process can equal this performance while effectively removing slate, sulphur, pyrite, shale, fire-clay, gravel, bone and tramp iron.

The reasons are found in SuperDuty's Diagonal Deck and in SuperDuty's sound engineering. For full details, write for Bulletin 119.

CONCENCO FEED DISTRIBUTOR

The Concenco Revolving Feed Distributor is a heavily fabricated, all steel machine, with motor drive requiring only ¾ H.P. in operation. This distributor effectively provides a splitting of feed into any desired number of equal portions. It is especially suitable for feeding efficiently a battery of coal washing tables.

THE DEISTER ★
CONCENTRATOR
COMPANY
903 Glasgow Ave. • Fort Wayne, Ind., U.S.A.
CONCENCO PRODUCTS

★ *The ORIGINAL Deister Company* ★ *Inc. 1906*

branch, Office of Synthetic Liquid Fuels, U. S. Bureau of Mines, Louisiana, Mo., analyzed progress in hydrogenation and offered the conclusion that both processes probably are essential for a well-rounded synthetic-liquid-fuel program. Since the products of the two processes have different characteristics, neither is the complete answer to all problems.

Western coals, because of their characteristics, are particularly attractive for hydrogenation. A plant with a nominal capacity of 30,000 bbl. of products per day, it is estimated, would produce the following: gasoline, 22,100 bbl.; liquefied petroleum gases, 7,350 lb.; phenol, cresols and zylenols, 467,000 lb. Cost of such a plant, as originally estimated, would be $204,000,000, breaking down as follows: hydrogen production and compression, $61,000,000; hydrogenation, including coal preparation, $80,000,000; distillation, tankage and phenol recovery, $16,000,000; power and plant facilities $87,000,000. Since this estimate was first made, indications are that it can be revised downward to some extent.

Gasoline, it is estimated, can be produced by hydrogenation at a total cost of 16.9c and a net cost of 13.3c per gallon, as follows: Coal at $3.56 per ton, 4.8c per gallon: labor ($1.75 per hour) and supervision, 1.3c; maintenance, 2.1c; overhead, supplies and indirect costs, 3.2c; amortization over 15 years, 4.8c; taxes, 0.7c; total, 16.9c per gallon. Subtracting liquefied petroleum gas and phenol yields of 2.6 and 5c. per gallon, respectively, brings the estimated cost down to 13.3c. per gallon net.

Replying to a question as to whether low-temperature distillation was being considered, Dr. Hirst declared that considerable thought was being given to combination processes. Reviewing thinking and public statements by various authorities, I. N. Bayless, president, Union Pacific Coal Co., Omaha, Neb., pointed to oil's efforts to increase production and termed it the big "if" in the synthetic picture, along with the economic situation in the United States. However, he declared, another emergency probably would speed up development materially. However, indications are that future excesses in demand over the supply of liquid fuels will be met by coal and, since the West has about 80 percent of the raw material, it can look forward to benefiting from developments in that region.

Pillar extraction in 16-ft. coal under heavy cover was the subject of a paper by George B. Jackson, general superintendent, Independent Coal & Coke Co., Kenilworth, Utah, read by E. O. Jackson, mine superintendent. The coal is hard and the seam pitches about 11 percent north. The cover includes sandstone bands 4 to 65 ft., which frequently are hard to break.

The aim at Kenilworth mine is 100 percent extraction. Earlier efforts, marked by failure to achieve the de-

Eriez NON-ELECTRIC *Permanent* MAGNETIC SEPARATORS

THE NEW ANSWER FOR TRAMP IRON REMOVAL

ERIEZ Permanent Non-Electric Magnetic Pulleys and plates are being efficiently used to protect coal preparation equipment from tramp iron damage.

The Eriez Magnetic Pulley, used as a head pulley in belt conveyors, and Eriez "GIANT" plate separators installed in chutes ahead of washers, crushers, pulverizers, etc., provide a simple solution for tramp iron removal. Easy to install, economical and powerful, these units designed specifically for cleaning coal have been thoroughly field tested . . .

Eriez Permanent Magnetic Separators can be used under the most severe operating conditions . . . Powered by special giant alnico magnets they require no outside source of power . . . Heat, cold or moisture does not affect their operating efficiency . . .

Eriez Non-Electric Magnetic Equipment is reducing mine operating costs and keeping customer goodwill by protecting processing equipment from damage, recovering expensive tools, and improving quality of coal . . . Your magnetic protection is positive and PERMANENT when you specify ERIEZ.

CA-8

CLIP AND MAIL TODAY
Please send bulletin No. 102B

We would like to know more about installation of ERIEZ on:
☐ Gravity Conveyors ☐ Mechanical Conveyors
☐ Equipment on Processing Machines

Name.....

Address.....City.....State.....

● *When It's Magnetic Protection . . . See Eriez First*

ERIEZ MANUFACTURING COMPANY

60 East 12th Street, Erie, Penna.

NORTH • EAST • SOUTH • WEST • IT'S SCHRAMM!

CHOOSE *as others have* **THE MODEL THAT BEST FITS YOUR NEEDS!**

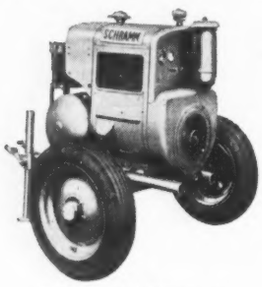
There's a Schramm Air Compressor, size and model, to meet your specific needs!

Below are listed some of the many Schramm models, portables ranging from 20 to 420 cu. ft. of actual air, the stationary ranging from 2 to 600 cu. ft. displacement.

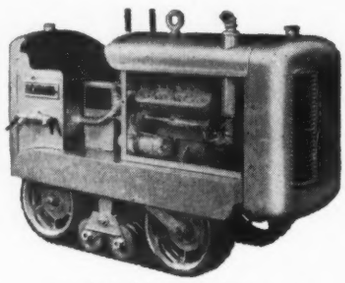
On all models performance records are evidence of their high quality. You will find the name Schramm written on every important page in compressor history.

Features you get in Schramm are: 100% water cooled, assuring ideal performance summer and winter; mechanical intake valve, forced feed lubrication, and electric-starter starting. All Schramms are compact, lightweight, easy to operate.

We invite you to write today for fully illustrated catalog describing in detail each of the Schramm Air Compressors shown here . . . plus a wide range of other models. We feel the Schramm story is a good one, and offers you a sure way to get your many compressed air jobs done quickly, efficiently, and economically.

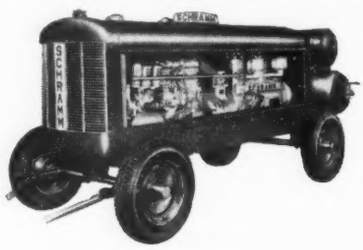


20/35 Model Compressor

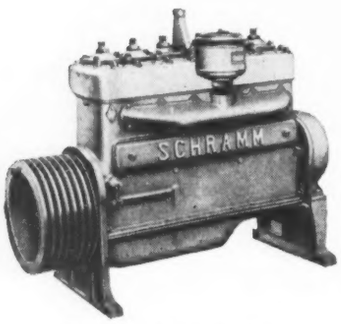


No. 60 Self-Propelled Compressor

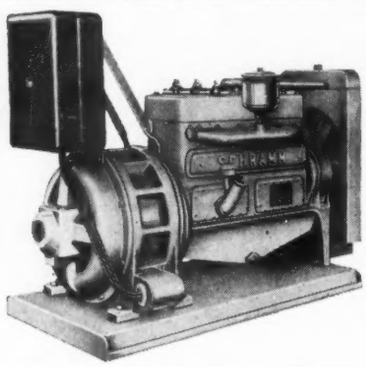
Skidded for Truck Mounting



Diesel Engine Drive



"V" Belt on Flat Pulley Drive



Built-in Motor Drive with Cooling Unit and Starter

SCHRAMM INC.

THE COMPRESSOR PEOPLE • WEST CHESTER • PENNSYLVANIA

sired goal, go back many years. About 1932, however, a definite plan was adopted and considerable experience was gained. Installation of shaker conveyors in 1936 helped pillar work and provided other advantages. The latest plan as inaugurated in January, 1947, and involves driving 3,000 ft. to the boundary and walking back, angling the rooms down the pitch, since it was found that working up to caved areas in the earlier systems resulted in severe bounces. The new plan assures that the weight above will not throw over into the open work below.

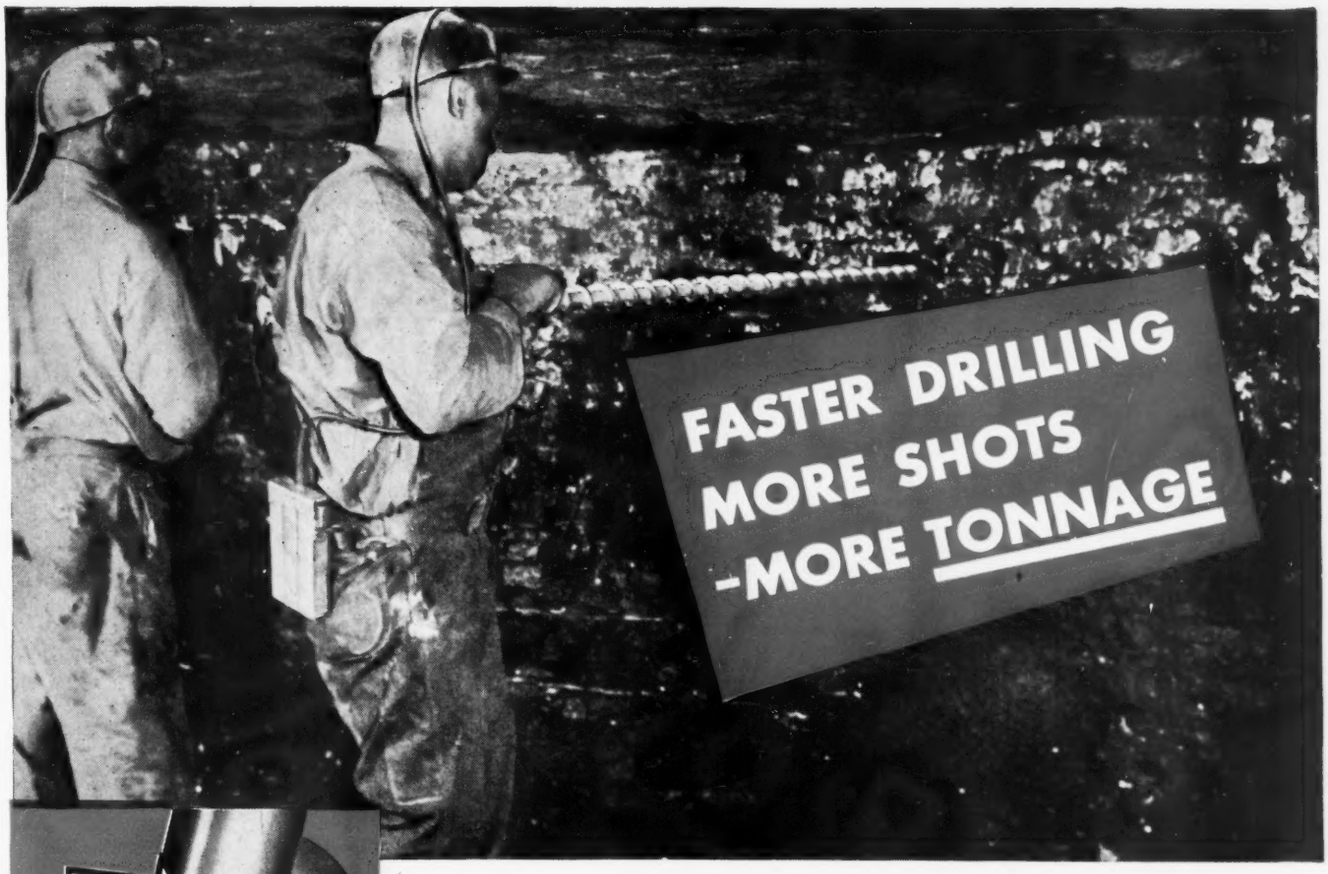
Under the new plan every attempt is made to keep open work away from the pillaring area. Rooms are driven in advance only as necessary and attention now is being concentrated on determining the correct distance between pillaring and open work. The production equipment comprises 11BU loaders and 10-ton battery-powered shuttle cars. Trackless operation, Mr. Jackson, stated, is safer and facilitates maximum coal recovery.

Conclusions to be drawn from Kenilworth experience were summarized as follows: pillar work should not be rushed or crowded and space sections are very worthwhile; a panel under Kenilworth conditions should not be larger than 1,200 by 2,000 or 2,500 ft., or enough for about nine years' work; the panel should be protected by permanent barriers; large pillars or blocks should not be left between pillar and open work since they tend to concentrate weight with resultant trouble.

Supplementing his discussion with a demonstration of the equipment, N. F. Wetzel, Wetzel Equipment Agency, Salt Lake City, opened the final session with a discussion of the installation and use of the Femco trolley phone. Higher efficiency in mine haulage was emphasized by Mr. Wetzel, who also brought out the following additional advantages: quicker handling of injured men as a result of more positive and more rapid communication; savings in man-trip operation by elimination of possible conflicts with other haulage; more efficient handling of supplies; better dispatching trips where heavy grades are encountered; rapid reporting of mine fires; and ability to locate key personnel quickly.

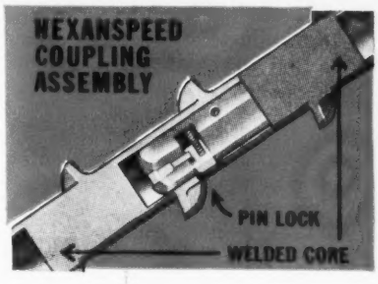
Good communication, said Mr. Wetzel, is possible at 3 to 4 miles, with noise beginning to come in at about five miles. A repeater can be used, but the best practice is to locate the central station at a central point.

Presenting in detail examples of grounding both d.c. and a.c. off-track equipment and relay protection, J. A. Setter, industrial engineer, General Electric Co., Denver, declared that "the purpose of grounding electrically driven mining machinery is to protect the workmen against shock and at the same time try to save the electrical equipment itself from serious



Less resistant and faster conveying.

Rigidly inspected Coalmaster Steel Bits heat treated for high strength, wear, and abrasion resistance.



Auger changing time reduced to a fraction.

3-WAYS FASTER and ALL WAYS BETTER DRILLING with COALMASTER

The Spir-L-Weld of Coalmaster augers provides a smoother, fast conveying flight surface with reduced resistance and less strain on the operator or equipment.

Coalmaster Bits are engineered and designed for scientifically correct cutting edges and accurate bevel to achieve fast, true cutting. Secured by Coalmaster patented Z-type wedges, they are rigidly positioned in perfect alignment.

Time lost in auger changes is a thing of the past with quick make-and-break Hexanspeed couplings. Auger changes are a matter of seconds. Note how this high strength, rigid coupling (at left) makes possible the tubular core that gives the advantage of light weight augers for underground drilling.

DRILLING COALMASTER TOOLS

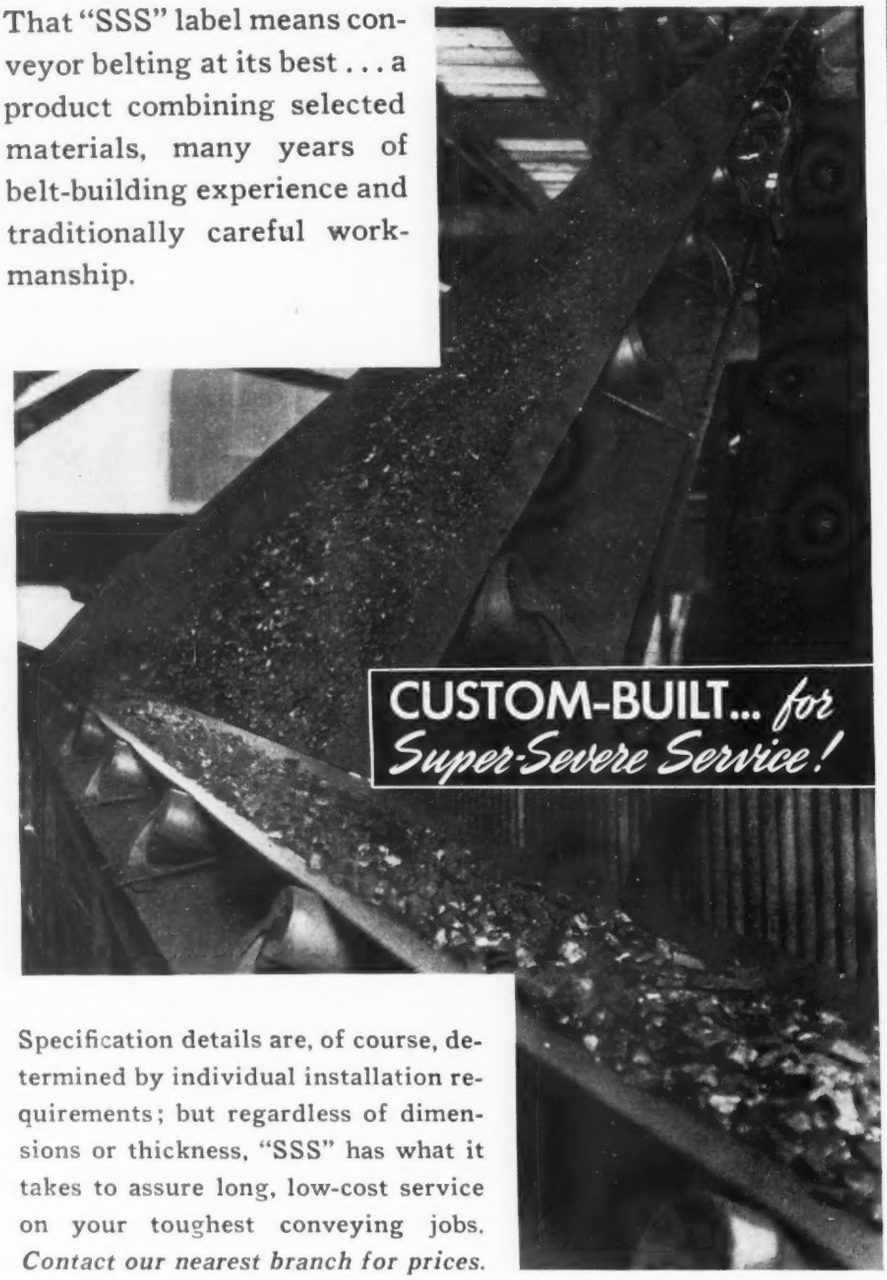
CENTRAL MINE EQUIPMENT COMPANY

ST. LOUIS 15, MO.

• AUSTIN POWDER COMPANY, Cleveland, Ohio • THE BUDA COMPANY, Harvey, Illinois • DIAMOND SUPPLY COMPANY, INC., Evansville, Indiana • DOOLEY BROTHERS, Peoria, Illinois • ILLINOIS POWDER MFG. CO., St. Louis, Missouri; Denver, Colorado; Salt Lake City, Utah • JOY MFG. CO., Main Office: Pittsburgh, Pa.; Subsidiaries and Representatives in 57 Countries • SALEM TOOL COMPANY, Salem, Ohio • BRITISH-AMERICAN INDUSTRIES, LTD., New York City, New York • BALIMO, LTD., London, England.

GOODALL "SSS" CONVEYOR BELTING

That "SSS" label means conveyor belting at its best . . . a product combining selected materials, many years of belt-building experience and traditionally careful workmanship.



Specification details are, of course, determined by individual installation requirements; but regardless of dimensions or thickness, "SSS" has what it takes to assure long, low-cost service on your toughest conveying jobs. *Contact our nearest branch for prices.*

A GOODALL *"Standard of Quality"* PRODUCT

GOODALL RUBBER CO., INC.

THE GOODALL-WHITEHEAD COMPANIES

MILLS and EXPORT DIVISION, TRENTON, N. J.—ESTABLISHED 1870

Branches: Philadelphia • New York • Boston • Pittsburgh • Chicago • St. Paul • Los Angeles San Francisco • Seattle • Salt Lake City • Houston • Distributors in Other Principal Cities

damage as a result of arcs and short circuits." Since, in a d.c. system, the current eventually must find its way back to the negative terminal of the generator, the answer to the problem of shock from grounded equipment is a low-resistance ground which will bypass the workman and carry this short circuit current directly to the rail and thence to the generator negative. By inserting a fuse or circuit breaker in the line, the current flow can be limited before destruction occurs. This, in general, is the basis for the safety grounding of electrical equipment in and around coal mines."

The big advantage of proper grounding, Mr. Setter pointed out, is the prevention of shock and consequent injury or death, with losses to the miner, his family, his employer and the insurance company. The second advantage of grounding is prevention of damage to equipment and loss of production. Elimination of equipment damage, however, requires additional protection. The best is provided by an air circuit breaker with a small relay in the ground circuit that will trip the breaker on a current of only 2 to 5 amp., thus cutting power off the unit before a destructive arc can occur. Breakers cannot be blocked in, closed on a short or have their overload trip-setting changed by the men. Service can be restored merely by turning the handle, against an average loss of 15 minutes when a fuse blows. Maintenance cost is reduced and operation with breakers is conducive to better handling of equipment. Since there are no exposed current-carrying parts, safety is increased.

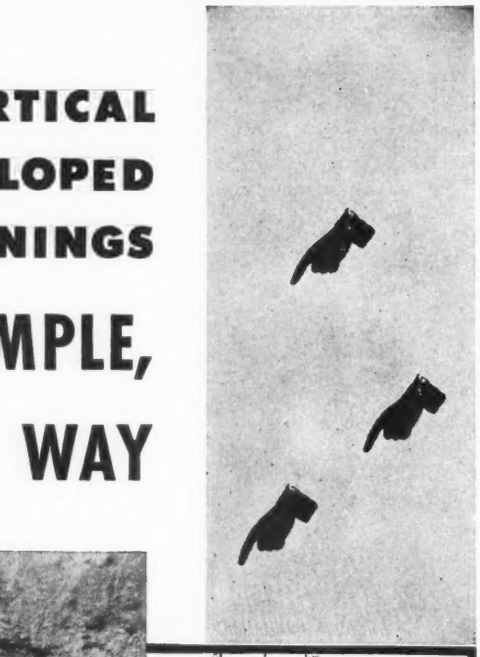
Disadvantages of grounding were summarized by Mr. Setter as follows: increased cost of trailing cables, although this increase is not great in view of the other advantages; present cables must be discarded but since cable is expendable this is not a major factor; weight and size of cables are increased, although new designs are materially reducing the difference; splicing is more difficult but since improper splicing means tripping the breaker it should result in better splicing; grounding results in other minor difficulties which, however, are reduced by using ground-tripping relays and circuit breakers.

Manufacturers, said R. G. Gehlsen, Mines Equipment Co., St. Louis, Mo., in discussion, are ahead of the safety authorities in the promotion of proper grounding and equipment protection. The breaker is now coming into its own and standards governing its installation and use will be set up and approved. The result will be a reduction in the fire hazard, greater protection for men and less damage to equipment. Modern grounding and breaker protection makes it impossible to do it wrong, thus increasing operating time and production. New developments include a pole in series with the relay to protect the trip coil and a fault-finder for cables.

YOUR PROFITS ARE IN DIRECT
PROPORTION TO THE NUMBER
OF "TOOL STEEL PROCESS" PARTS USED
All "Tool Steel" parts are guaranteed to handle more coal than any other products used in the same service.
Their maintenance records show a superiority of trouble-free service that in many cases exceeds a ratio of 13 to 1.
These profit facts speak for themselves. Write today for complete information.
"TOOL STEEL PROCESS"
The Standard of Quality
for GEARS • PINIONS • SPROCKETS • WHEELS and other HARDENED PRODUCTS
THE TOOL STEEL GEAR & PINION CO.
CINCINNATI 16, OHIO

BUILD VERTICAL OR SLOPED OPENINGS

THIS SIMPLE, SPEEDY WAY



Air shafts and escapeways are built quickly and economically with ARMCO Tunnel Liner Plates.

Here's an easy, economical way to provide ventilation and safety as active workings extend from original mine openings. Simply use ARMCO Tunnel Liner Plates to sink new shafts.

These plates are amply strong and provide worth-while durability and safety from fire hazards. One man easily handles the light-weight steel sections, bolting them together with regular wrenches. Costs are low and the job is speeded.

You'll find ARMCO Tunnel Liner Plates ideal for sloped entries, air shafts, escapeways, substations and overcasts. Write for data on Armco tunneling methods. Armco Drainage & Metal Products, Inc., 1575 Curtis St., Middletown, Ohio.

ARMCO

ARMCO TUNNEL LINER PLATES

EQUIPMENT APPROVALS

Four approvals of permissible equipment were issued by the U. S. Bureau of Mines in June, as follows:

Joy Mfg. Co.—Type T2B-6APE/F machinery moving truck; two 4-hp. motors and one cable-reel motor, 250 and 500 volts d.c.; Approvals 2-622 and 2-622A, respectively; June 15.

Joy Mfg. Co.—Type 8BU-12H rock loader; 15-hp. motor, 440 volts a.c., 60 cycles; Approval 2-623A; June 21.

Joy Mfg. Co.—Type 11BU-9APN load machine; two motors, 50 and 4 hp., 500 volts a.c., 50 cycles; Approval 2-624A; June 21.

Joy Mfg. Co.—Type 11BU-11BE/F loading machine; two motors, 50 and 4 hp., either 250 or 500 volts, d.c.; Approvals 2-625 and 2-625A, respectively; June 24.

New Features to Mark Bluefield Coal Show

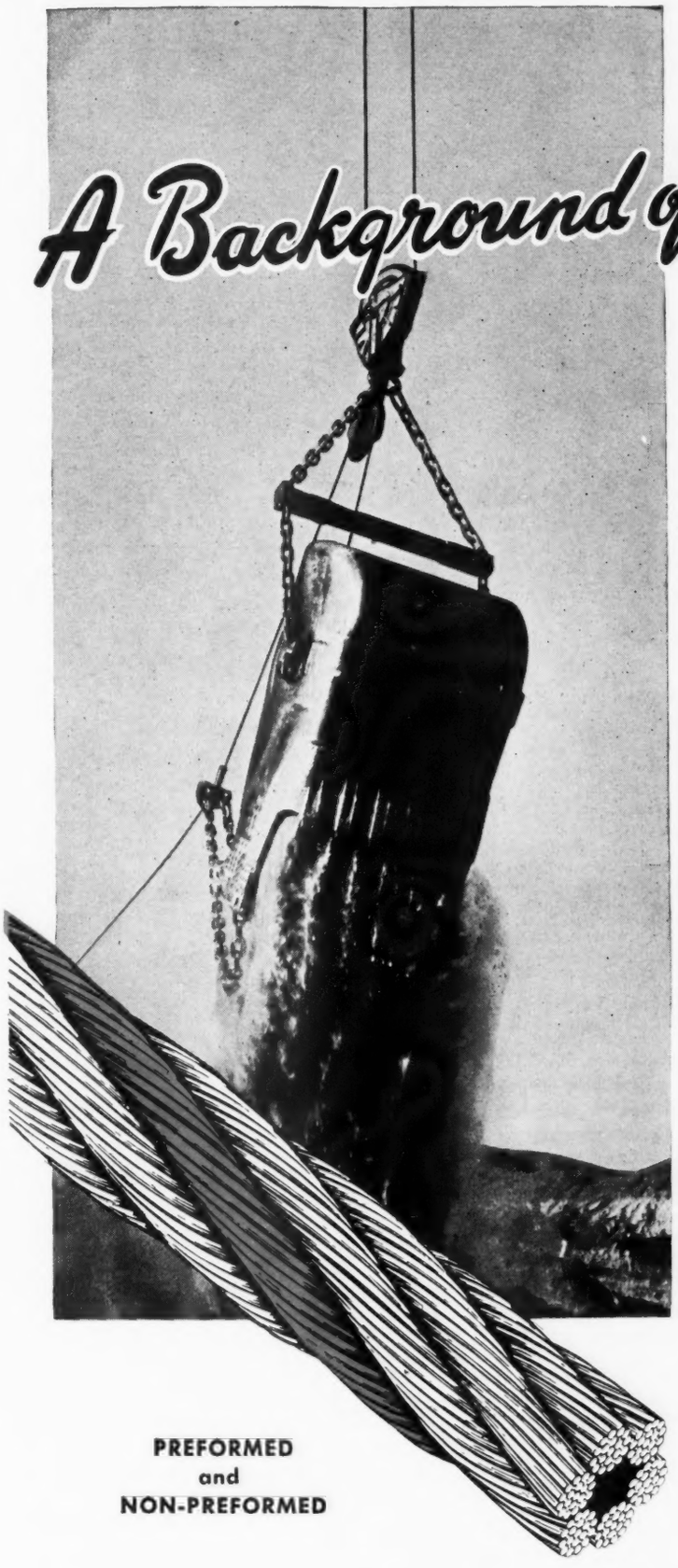
All the old features and several new ones will highlight the Southern Appalachian Industrial Exhibit to be held Aug. 19-21 at Bluefield, W. Va., according to W. E. McQuail, general chairman, and B. B. Housman, director, who promised that this year's show will be the biggest in the region's history. In addition to the "Old Timers'" conclave and special contests for prizes for the best homespun inventions displayed by miners, there will be several industrial motion-picture films shown by manufacturers and a combination cocktail party, buffet supper and floor show. Adding to the educational value of manufacturers' exhibits, which already have booked all space available to that group, there will be exhibits by West Virginia University, the National Coal Association, the U. S. Bureau of Mines, Virginia Polytechnic Institute, Bituminous Coal Institute and several other non-commercial organizations.

•

Welding Coal Cars Will Speed Output

A new process of welding instead of riveting steel railroad coal cars promises faster output to fill the needs of coal-carrying railroads, it was announced June 30 by officials of the American Car & Foundry Co., Huntington, W. Va. The new process, which involves welding about 2,000 ft. of seams in each 70-ton hopper car, was put into operation in April after the Chesapeake & Ohio Rwy. had placed an order for 6,000 of the cars. In preparation for the changeover, several hundred of the plant's 1,100 employees were given a five-

A Background of PERFORMANCE



PREFORMED
and
NON-PREFORMED

When you specify "HERCULES" (Red-Strand) Wire Rope, you select a product that has proved its dependability—time after time—by the acid test of actual service.

Such a long and *consistent* record of performance is not a matter of chance; instead, it is the result of many definite factors that have always governed the design and manufacture of "HERCULES" (Red-Strand) Wire Rope.

For wire rope qualified to withstand the stresses and strains encountered on tough jobs...use "HERCULES" and benefit by its time and money saving ability.

"HERCULES"®
(RED STRAND)
the DEPENDABLE
WIRE ROPE
for any TOUGH JOB

® REG. U.S. PAT. OFF.

MADE ONLY BY

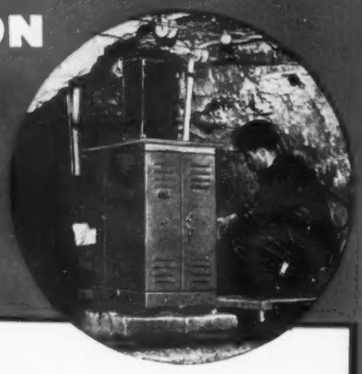
A. LESCHEN & SONS ROPE CO.

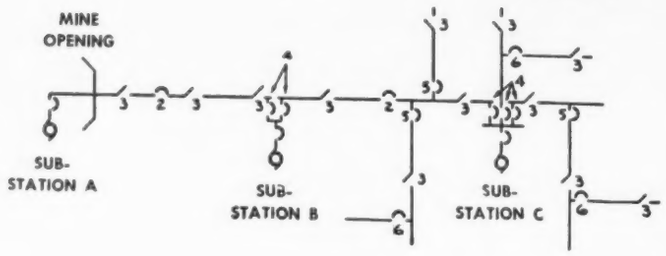
ESTABLISHED 1857

5909 KENNERLY AVENUE • ST. LOUIS 12, MISSOURI

Another I-T-E PRODUCTION-BOOSTING SECTIONALIZATION PLAN

Sample layout No. 4 in a series illustrating recommended sectionalizing practices





Key
2. I-T-E Type KSC Circuit Breaker—installed in circuit between each two substations.
3. A disconnect switch or protective device placed at not over 1500 foot intervals in every power line.
4. I-T-E Type KSA Circuit Breaker (trip-free operating mechanism)—used as overcurrent protective device in each circuit leaving a substation.
5. I-T-E Type KSC Circuit Breaker—installed as overcurrent protective device at each main branch circuit.
6. I-T-E Type KSC Circuit Breaker—to protect secondary branch circuits (*i. e.* a circuit feeding only one local section or territory).

Note: In every case, sufficient feeder and return circuit capacity should be provided so that circuit breaker will be opened by a dead short at the most remote point of the circuit.

When electrical distribution systems are sectionalized with I-T-E Sectionalizing Switchgear, production levels are raised: time lost because of electrical disturbance is kept to a minimum, and safety to personnel and equipment is assured.

In the above application, the heart of protection is the I-T-E Type KSC Automatic Reclosing Circuit Breaker. The only circuit breaker designed especially for the mining industry, the KSC has ample flexibility for meeting changing mine conditions. Completely dependable, it is durable and efficient under the most severe operating demands. Rugged and compact for easy portability, it is also completely metal-enclosed for safety—yet readily accessible for inspections and maintenance.

The I-T-E representative in your locality can give you complete information on the I-T-E Type KSC Automatic Reclosing Circuit Breaker. He is also fully qualified to assist you in the adoption of recommended sectionalizing practices in your mine. Use his services with no obligation.

Be Production-Wise... Sectionalize

S-E-C-T-I-O-N-A-L-I-Z-I-N-G
SWITCHGEAR
The Leader In Technical Excellence

I-T-E CIRCUIT BREAKER COMPANY, 19th & HAMILTON STS., PHILA. 30, PA. 31 OFFICES IN U.S. & CANADA
SWITCHGEAR • UNIT SUBSTATIONS • AUTOMATIC RECLOSING CIRCUIT BREAKERS

MEETINGS

- Pocahontas Electrical & Mechanical Institute: Southern Appalachian Industrial Exhibit, Aug. 19-21, Bluefield, W. Va.
- National Association of Foremen: annual convention, Sept. 23-25, Philadelphia Convention Hall, Philadelphia, Pa.
- National Coal Association: annual meeting, Oct. 4-6, Waldorf-Astoria Hotel, New York City.
- Coal Exporters Association of the United States: annual meeting, Oct. 7, Hotel Biltmore, New York City.
- Illinois Mining Institute: 56th annual meeting, Nov. 5, Hotel Abraham Lincoln, Springfield, Ill.
- National Safety Congress and Exposition: Oct. 18-22, Stevens Hotel, Chicago, Ill.

week training course. The new method is said to turn out a completed car every 17 minutes.

•

Coal Town Doctor Quits on Racial Issue

Dr. Oscar H. Clements has closed his clinic in Palmer, Tenn., in protest against "racial discrimination" after 14 years' residence in the town. The doctor shut down his office and moved away after five white men allegedly ordered four Negroes to stop work at the site of a new house he was building. Mine officials and local citizens said the area would be without quick medical aid in case of a mine disaster or serious illness.

•

Madisonville First-Aid Meet Set for September

The annual miners' first-aid meet, sponsored by the Western Kentucky Mining Institute, will be held in the Madisonville, Ky., municipal park either the first or last Saturday in September. So far, 11 white and four Negro first-aid teams and five white mine-rescue teams have been entered in the contest. Officials from the Kentucky and Indiana Mines and Minerals Departments and expert miners from eastern and westen Kentucky fields will act as judges for the meet.

•

NLRB Charges Union Forces Men to Join

District 31, U.M.W.A., was accused June 29 of refusing to let about 425 non-union miners leave four West Virginia pits until they had signed applications for union membership. The charges, based on an incident which occurred during the pension walkout in April, were filed through

Manhattan engineers set out to design a conveyor belt with all the resilience needed to absorb the shock of heavy lumps. The cross-section you see above illustrates how well they succeeded with HOMOCORD, a construction developed specially and *only* for conveyor belt use.

"Rippling Muscles" Construction, is the most apt description of Homocord Conveyor Belt. Each of Homocord's sinews, or strength members, is embedded in muscles of Flexlastics. You can see how this construction dissipates the force of a heavy blow, the constant pounding of heavy material at loading points.

Homocord Conveyor Belt flexes very easily. It troughs much better and runs true in the idlers. These are all factors for longer belt life. Homocord embodies everything you want for heavy mine hauls . . . a cushioned . . . tough . . . flexible . . . mildew-proof conveyor belt that will cut your costs appreciably.

Manhattan also introduced the first long-lift conveyor belt with Rayon Cord Strength Members. Investigate the advantages of RAY-MAN "Tension Master" Conveyor Belt.

A COMPLETE LINE FOR MINES

Hose, Belting and other rubber products, Engineered by Manhattan for mining efficiency, safety and economy.

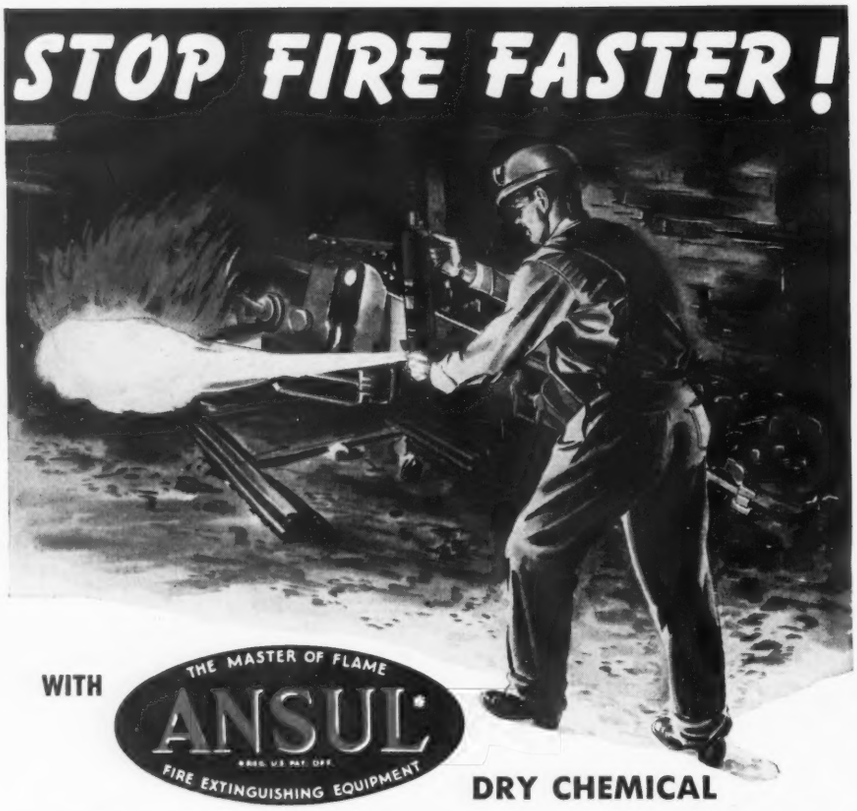
RAYBESTOS R M MANHATTAN

RAYBESTOS-MANHATTAN INC.

Keep Ahead with Manhattan

MANHATTAN RUBBER DIVISION **PASSAIC, NEW JERSEY**

STOP FIRE FASTER!



WITH THE MASTER OF FLAME ANSUL® REG. U.S. PAT. OFF. FIRE EXTINGUISHING EQUIPMENT DRY CHEMICAL

FIRE EXTINGUISHERS

MORE EFFECTIVE · MORE ECONOMICAL

NON-TOXIC FIRE PROTECTION

Ansul Dry Chemical Fire Extinguishers give you more protection . . . pound for pound . . . dollar for dollar . . . than any other extinguisher of comparable size. In addition . . . Ansul Fire Extinguishers provide the best first-aid protection:

For all hazards involving electric wiring and equipment.

For hazards on mining machines involving lubricating oils, greases and flammable liquids.

Ansul Fire Extinguishers have the highest established ratings for effectiveness on flammable liquid fires, based on tests by nationally recognized approval agencies. The longer range stream of dry chemical is effective in winds and drafts.

After use, Ansul Dry Chemical Fire Extinguishers can be recharged "on the spot" . . . providing continuing protection . . . and annual recharging of Ansul extinguishers is NOT necessary.

Safe to use . . . non-toxic, non-corrosive, non-abrasive.

Ansul Dry Chemical Fire Extinguishers are preferred fire protection in many of the larger coal mines.

Ask for your copy of file No. 226. You will receive factual data on how Ansul Dry Chemical Fire Extinguishers will cut your fire protection costs.

Listed and approved by Underwriters' Laboratories and Factory Mutual Laboratories.

ANSUL CHEMICAL COMPANY
FIRE EXTINGUISHER DIVISION, MARINETTE, WISCONSIN
DISTRIBUTORS IN ALL PRINCIPAL CITIES

the Pittsburgh regional office of the NLRB. A trial examiner will hear the complaint Aug. 10.

Beatings of some non-union miners and mass picketing also were included in the charges against the union. The incidents were alleged to have occurred at mines operated by the Ruthbell Coal Co., the Hartman Coal Co., the Bergman Coal Co. and the Kefover Coal Co., all near Kingwood, W. Va.

•

Fuel Oil Is Short, Committee Warns

A subcommittee of the Senate Commerce Committee has warned that the fuel outlook for New England and the New York area next winter shows only slight safety margins and has urged continued conservation by consumers. Senator Clyde M. Reed, of Kansas, who headed the subcommittee, pointed out that stocks of fuel oil in eastern and Gulf areas were only four percent above stocks at the same time in 1947 and that 1947 stocks were insufficient to void serious shortages in some areas. Kerosene supplies are especially low, the Senator declared, citing the vast number of apartment dwellers in eastern metropolitan centers who depend on that fuel for winter warmth.

The committee will continue to watch the situation into the autumn months. Meanwhile, it drafted recommendations to the governors of the states in affected areas urging severe conservation measures to assure meeting minimum needs next winter.

•

Coal Publications

Determination of Moisture in Coal with the Brabender Semi-Automatic Tester, by H. M. Cooper, E. C. Tarpley and R. F. Abernethy. U. S. Bureau of Mines, R. I. 4304. 15 pp. plus 2 pp. of illustrations. 8x10½-in.; paper; mimo. Free. Even though the Brabender instrument does not meet several requirements of A.S.T.M. in construction, moisture values within permissible tolerances are obtained, except for anthracite.

Some Obervations on Coking Practice in Germany: Metallurgical Coke and Slanting Type Didier Coke Ovens, by Frank H. Reed. U. S. Bureau of Mines, I.C. 7462. 74 pp. 8x10½-in.; paper; mimeo. Free. New processes for pig-iron production on a laboratory scale have been investigated. Though not feasible for commercial practice at present, they may provide a means of continuing iron production in areas where the supply of coking coals is diminishing. Slanting type coke ovens can be built where space is not available for the more common slot-type oven and, since the coke is discharged principally by gravity, poorly coking coals may be carbonized by discharging weak coke which could

high..wide..*and handsome!*

Yes, an Oliver "Cletrac" crawler tractor and Drott Hi-Lift Loader give you a high, wide and handsome method of stepping up your stripping operations.

High . . . a 10½ foot lift from ground to hinge pin of bucket for easy loading into trucks up to 8½ feet high.

Wide . . . a deep, wide bucket that gets a full load every time. Bucket pivots . . . raising the cutting edge 16 inches . . . on two rugged shoes before lifting. With this effective break-out action, you can't help but get a bigger load without spillage.

Handsome . . . plenty of sure-footed power that gives you top crowding and stripping action with a husky Oliver "Cletrac" tractor.

This hydraulically operated tractor-loader unit bears down and in as it loads, then tilts upward like a shovel for a full bucket every time. If desired, the unit can be used for bulldozing. Remember, with the famous Oliver "Cletrac" balanced design, there's no excess strain on tractor frames or steering mechanism even with a full loaded bucket.

Let your Oliver "Cletrac" dealer show you how you can strip high, wide and handsome with this new unit.

OLIVER Cletrac SALES SERVICE

"THE SIGN OF EXTRA SERVICE"

Cletrac

a product of

The OLIVER Corporation

INDUSTRIAL DIVISION: 19300 EUCLID AVENUE, CLEVELAND 17, OHIO

Pre-fill Dummies for Greater Safety at the Bore Hole–

Dummies of Seal-Tite Tamping Bags, pre-filled at one central point, assure the use of permissible stemming materials. A supply of permissible dummies are kept *ready for use* at the face and can be stored underground under the most humid conditions. *Chemically-treated high wet-strength kraft* and plastic-locked safety seam protect them from breaking and spilling.

Dummies of Seal-Tite Bags are always ready for use. Save time—save labor and eliminate hazards at the face through use of proper stemming procedures.

SEND FOR SAMPLES... specify the sizes you need, or a complete assortment.

Tamping Bag Co.

212 SO. THIRD ST.
MT. VERNON, ILL.

not be pushed from a slot-type oven without crumbling and ruining the side walls of the oven chamber.

Acid Mine Water in the Anthracite Region of Pennsylvania, by E. W. Felegy, L. H. Johnson and J. Westfield. U. S. Bureau of Mines, T.P. 710. 49 pp. 5¾x9-in.; paper. 15c., Superintendent of Documents, U. S. Government Printing Office, Washington 25, D. C. Mine drainage is a major problem in anthracite mines and the difficulties encountered are becoming greater. No practicable method of removing the acid properties of mine drainage is known and it seems illogical that additional cost should be placed on the industry in an attempt to remedy a condition that, because of sewage and industrial wastes now being discharged into the streams, is at present beneficial rather than detrimental.

Safety Achievements of the Continental Mine, Continental-Archbald Coal Co., Scranton, Lackawanna County, Pa., by E. H. McCleary, H. A. Schrecengost, Alfred Clarkson and H. R. Gill. U. S. Bureau of Mines, I.C. 7468. 18 pp. 8x10½-in.; paper; mimeo. Free. Publications Distribution Section, 1800 Forbes St., Pittsburgh, Pa. Reduction of accident rates requires the cooperation of officials, workers and state and federal agencies. The better-than-average record at the Continental mine shows the value of such cooperation, the wisdom of employing a full-time safety engineer and the benefits of compliance with Bureau safety standards.

•

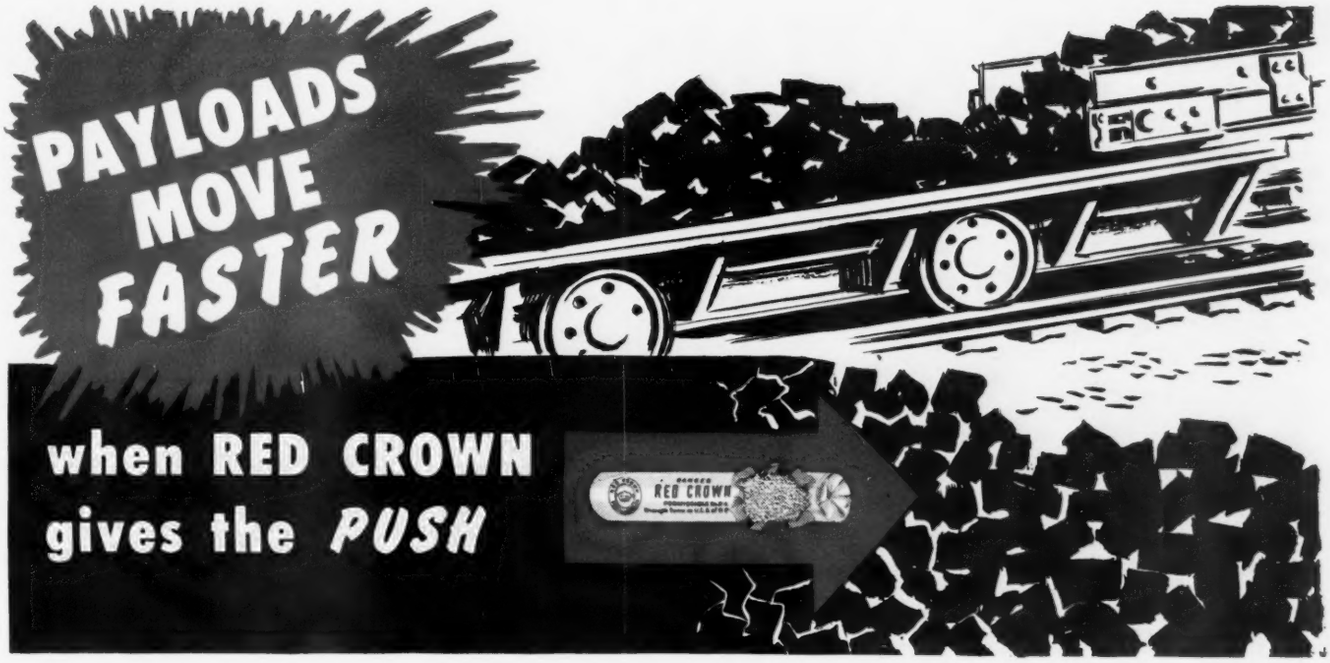
Company Offers to Sell Mine to Workers

The South Mine Co. has offered its employees an opportunity to purchase its mining property and the matter is being considered by the workers, who are members of the Progressive Mine Workers. According to Paul Cerar, superintendent, the company has an offer to lease the mine but would prefer selling it outright to miners. It is reported that the offering price is $62,000, with a down payment of $12,000.

•

Fire Strikes Tipple and Stored Coal

A $200,000 fire swept through the tipple of the Copperhead Coal Co., Barrs Mills, Ohio, July 2, completely destroying the structure and burning out 1,000 tons of coal. The fire was discovered in the refuse bin of the tipple at an early hour in the morning. Unable to halt the flames with water, the two workers who discovered the fire summoned fire-fighting equipment from nearby Sugarcreek. Destroyed in the blaze were the tipple building, three large conveyors, the crusher, 25



6 IMPORTANT ADVANTAGES

1. Red Crown is easy on the roof.
2. Slow heaving and spreading action with results similar to those obtained with the use of black powder.
3. Power distributed evenly throughout the face of the cut.
4. Coal displaced in firm, hard lumps means less degradation.
5. Red Crown, containing no nitroglycerine, is the non-headache permissible.
6. Less smoke and fumes means less down-time for expensive equipment.

YOU'LL GET MORE COAL AT LESS COST PER TON WITH RED CROWN...

King Powder's exclusive, patented Class A Permissible with *even distribution of power!*

Red Crown is surface-sensitized—its slow, heaving action has remarkable spread. It shears the ribs clean and does not severely shatter the coal in the vicinity of the hole. You'll get more lump and less slack—Red Crown produces excellent results in both firm or friable coal.

Here's how you can try Red Crown in your mine:

More and more mines are finding that Red Crown gives better preparation and performance. You can arrange an actual test with Red Crown in your mine—under your own operating conditions—by simply requesting a demonstration. Just write or phone us—we'll do the rest. There is no obligation, of course. Put Red Crown's 6 important advantages to work in your mine. Request a demonstration today.

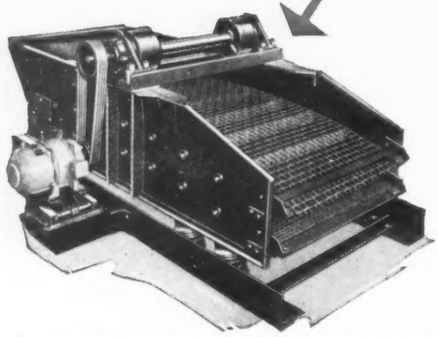
THE KING POWDER COMPANY, INC., CINCINNATI 1, OHIO

1878...Our 70th Year...1948

RED KING EXPLOSIVES CROWN

THE PATENTED, SURFACE-SENSITIZED PERMISSIBLE

A Deister Vibrating Screen handles run-of-the-mine coal at this preparation plant of The Steubenville Coal and Mining Company, Steubenville, O.



"THE best we ever used."

That's how John J. Sherrard, president of The Steubenville Coal and Mining Company, Steubenville, Ohio, describes the two-deck, 5′ x 10′ Deister Vibrating Screen which handles 100 tons of run-of-the-mine coal every hour at the company's mine.

This Deister Vibrating Screen has operated since 1942 with an excellent service and maintenance record. In fact, Mr. Sherrard comments, "the only repair necessary has been renewing the screen cloth".

Deister Vibrating Screens make possible faster, more accurate grading. The sturdy, all-welded construction minimizes downtime. The supporting structure of Deister Vibrating Screens is protected from vibration by full cushioning. Like Mr. Sherrard, *you will find the Deister Vibrating Screen the best* you have ever used. Write for full information.

DEISTER SCREENS

DEISTER MACHINE CO.

FORT WAYNE 4, INDIANA

motors, the roller screens and other equipment. Nearby offices and stock rooms containing equipment worth about $75,000 were saved. It was estimated that it will be five or six months before the plant regains capacity output.

Owners of the mine meanwhile went ahead with plans to build a new tipple 40 ft. high with a capacity of 1,000 tons in its 16 bins. Construction was scheduled to start July 15.

•

Personal Notes

H. D. Pinkney, superintendent, Morley mine, Colorado Fuel & Iron Co., Morley, Colo., has been named to succeed Murray M. Watson as head of the company's Frederick mine, Valdez. Mr. Pinkney will continue his duties at the Morley mine. Under his superintendency, the Morley operation was the first in the United States to receive a perfect report from the Bureau of Mines inspection service.

H. A. Cassell has been made superintendent of the new Itmann mine, Pocahontas Fuel Co., Inc., Itmann, W. Va. To succeed Mr. Cassell in his former position as superintendent of the Pocahontas Corp.'s mine at Bishop, Va., the company has named **Charles Stephenson** as superintendent.

Claude P. Heiner has been elected president of Utah Fuel Co., Salt Lake City, to succeed his father, Moroni Heiner, who died June 25. **Herbert A. Snow** has been named senior vice president of the company.

R. B. Wilson has been appointed director of personnel, Island Creek Coal Co., Holden, W. Va., succeeding **H. W. Lowe,** who has been recalled to active duty in the U. S. Army.

James G. Ault has been named director of the newly created department of industrial relations, Hanna Coal Co., St. Clairsville, Ohio. For some years past, Mr. Ault has been statistician for the company.

Julian E. Tobey has been elected president, Appalachian Coals, Inc., succeeding **R. E. Howe,** who has been made chairman of the board. Mr. Tobey, who has been director, Fairmont Coal Bureau, New York City, for the past six years, will assume his new duties Aug. 16 in Cincinnati, Ohio. The new position marks a return for Mr. Tobey, who first was retained by Appalachian Coals, Inc., as director of engineering in 1934 and later, in 1940, was elected vice president of that organization. Mr. Howe has been with Appalachian Coals, Inc., since its formation and for the past 11 years has been its president.

D. A. Thomas, president, Boothton Coal Mining Co., Boothton, Ala., has been elected to the board of directors of Bituminous Coal Research, Inc., by members of that organization.

COMPLETE INSURANCE

with this new line of RELIANCE CORROSION-RESISTING and EXPLOSION-PROOF MOTORS

FOR CORROSIVE ATMOSPHERES
The Totally-Enclosed Fan Cooled A-c. Motor for Applications where Chemical Atmospheres Prevail

UNDERWRITERS' CLASS I, GROUP D EXPLOSION-PROOF A-C. MOTOR
For Atmospheres Containing Hazardous Gas or Inflammable Liquids

UNDERWRITERS' CLASS II, GROUPS F & G EXPLOSION-PROOF A-C. MOTOR
For Atmospheres Containing Hazardous Dust

BUREAU OF MINES EXPLOSION-PROOF A-C. MOTOR
For Permissible Underground Equipment

Reliance Corrosion-Resisting Motor. Here is the result of Reliance engineering applied to the problem of protecting motors that operate in corrosive atmospheres. Frame and fan covers, fan, conduit box and end brackets are all made of selected corrosion-resisting materials. In addition, many extra steps are taken to achieve maximum protection, such as coating screws, counterboring screw holes and fitting-up with special compounds. Write today for Bulletin C-130!

Reliance Explosion-Proof Motors. Explosion-Proof construction is also available in this new line of motors. Built to the rigid explosion-proof standards set by Underwriters and Bureau of Mines, these types round out a selection of Reliance *Precision-Built* Motors which offers you the *right* motor for any application. For further information on Explosion-Proof Motors write for Bulletin C-124.

RELIANCE ELECTRIC & ENGINEERING CO.

1055 Ivanhoe Road **Cleveland 10, Ohio**

Appleton, Wis. • Birmingham • Boston • Buffalo • Chicago • Cincinnati • Dallas • Denver Detroit • Gary • Grand Rapids • Greenville, S. C. • Houston • Kansas City • Knoxville Little Rock • Los Angeles • Milwaukee • Minneapolis • New Orleans • New York Omaha • Philadelphia • Pittsburgh • Portland, Ore. • Roanoke, Va. • Rockford • St. Louis San Francisco • Seattle • Syracuse • Tampa • Washington, D. C. • Mexico City, Mexico Montreal, Canada • Sao Paulo, Brazil

RELIANCE A-C D-C MOTORS

"Motor-Drive is More Than Power"

Save 50% on Repair-Part Costs

Hard-surface with P&H Hartop electrodes—make your equipment last longer, produce more

Take a good look at this sprocket. Though badly worn, it is being built up with P&H Hartop. When the hard-surfacing is finished, this sprocket will cost ½ as much as a new one and will last 2 to 3 times longer. For Hartop's hard, protective coating gives you that much extra service. That's why using Hartop is a quick, low-cost way for you to keep your equipment at work longer, make it more productive. Hartop comes to you in handy weather-proof containers. You owe it to yourself to have a supply of these easy-to-use electrodes on hand. Four different types are available to give you the hardness you need:

Hartop Brown gives you a Rockwell C hardness of 35-40.

Hartop Green has a Rockwell C hardness of 45-50.

Hartop Red is still harder, giving you a Rockwell C hardness of 50-55.

And Hartop Yellow is the hardest electrode in the group — its Rockwell C reading is 58-63.

Use Hartop to keep your maintenance costs down and your production up. Ask your P&H distributor for our trial package containing all 4 types of these money-saving electrodes. It costs only $4.25. If he can't supply you, write us.

P&H WELDING ELECTRODES
4540 West National Avenue
Milwaukee 14, Wisconsin
HARNISCHFEGER CORPORATION

D. R. Schooler, consulting engineer, Chicago, has returned to the Missouri School of Mines, Rolla, Mo., as associate professor, a position he held from 1942 to 1947.

A. B. Foulger, general manager, Lion Coal Corp., Salt Lake City, Utah, and past president, Utah Coal Operators Association, has been elected to the board of directors, Bituminous Coal Research, Inc.

•

Obituaries

Robert H. Moore, 61, vice president and treasurer, Jewell Ridge Coal Corp., and treasurer, Virginia Smokeless Coal Co., Tazewell, W. Va., died July 18 in the Bluefield Sanitarium.

Charles Monroe Dodson, 36, part owner of the Dodson Bros. Coal Co., Ransom, Ky., died July 12 in a slate fall inside the mine.

Preparation Facilities

Lehigh Navigation Coal Co., Coaldale, Pa.—Contract closed with Wilmot Engineering Co. for two 5-ft.-diameter Wilmot Hydrotators to prepare barley coal; total feed capacity, 80 t.p.h.

Kehoe-Berge Coal Co., Pittston, Pa.—Contract closed with Wilmot Engineering Co. for one 6-ft.-diameter Hydrotator for No. 4 coal; feed capacity, 50 t.p.h.; and one 12-ft.-diameter Wilmot classifier for No. 5 coal; feed capacity, 50 t.p.h.

Glen Alden Coal Co., Wanamie Colliery, Pa.—Contract closed with Wilmot Engineering Co. for one 8-ft.-diameter Wilmot Hydrotator for rice coal; feed capacity, 100 t.p.h.

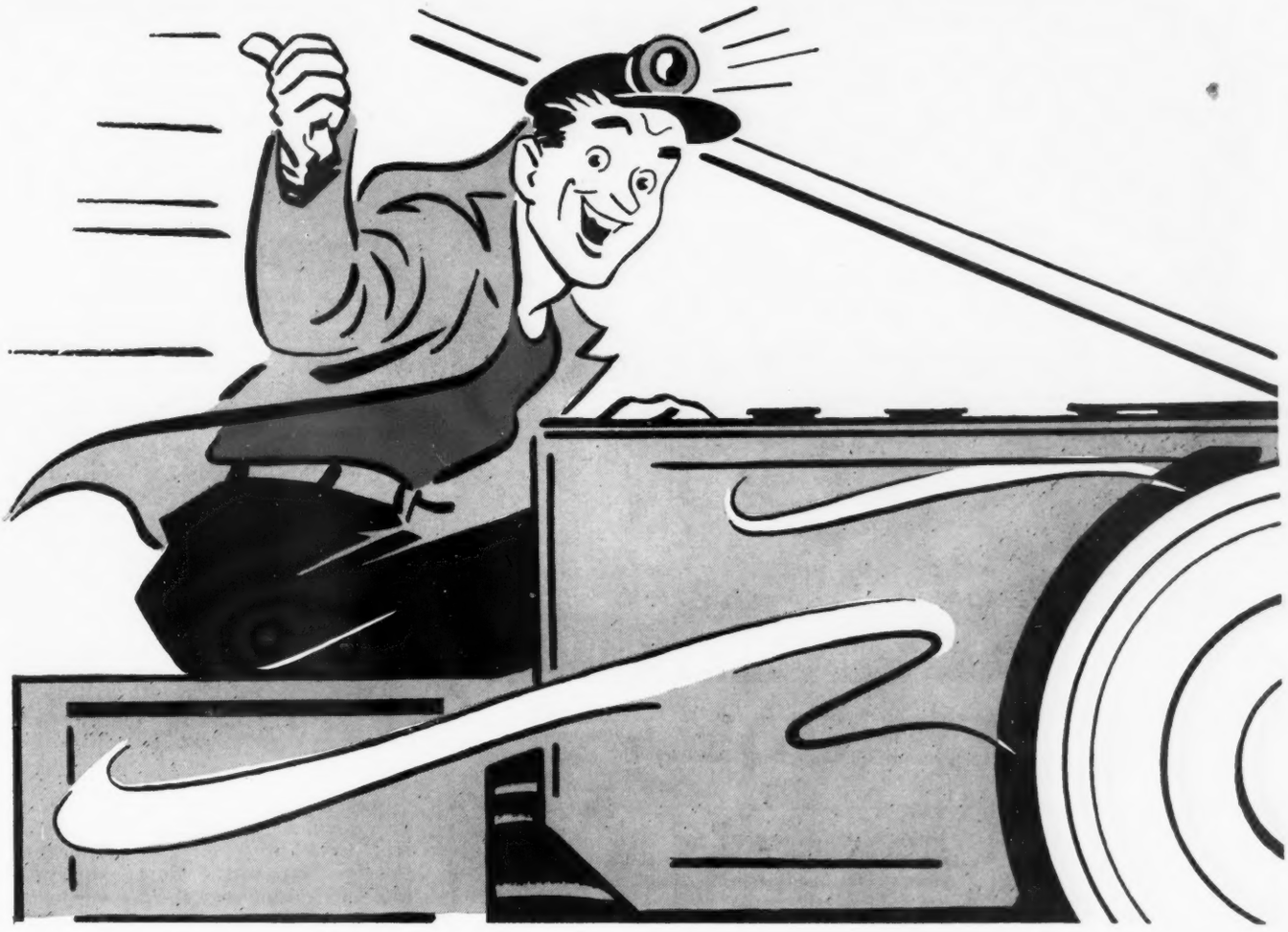
Savitsky Bros., Atlas, Pa.—Contract closed with Wilmot Engineering Co. for one Type A jig for nut coal; feed capacity, 15 t.p.h.

B. & N. Coal Co., Cressona, Pa.—Contract closed with Wilmot Engineering Co. for two Type A jigs for stove and nut coal; total feed capacity, 30 t.p.h.

The Hocking Valley Mining Co., Kimberly, Ohio—Contract closed with Roberts & Schaefer Co. for a coal washery to clean 5x⅜-in. coal; capacity, 100 t.p.h.; the washing unit to be R&S Hydro-Separator.

Pocahontas Fuel Co., Itmann, W. Va.—Contract closed with Roberts & Schaefer Co. for air cleaning plant; capacity, 350 t.p.h. of ⅜x0-in. coal; R&S Super-Airflow coal cleaning units to be used.

Princess Elkhorn Coal Co., Permele, Ky.—Contract closed with Roberts & Schaefer Co. for coal washery to clean



"these new mine cars really roll!"

"Since we got A.C.F. mine cars, I'm actually finishing every run minutes faster than I ever did before! Takes less power to pull a trip that rides on roller bearings, so my average speed is up! They're easier to start, too – these two-way bumpers cushion the shock when I start to pick up the weight of the cars ...it's not like breaking through a string of brick walls to get the trip moving. Yep... these A.C.F. cars can really highball a trip of coal."

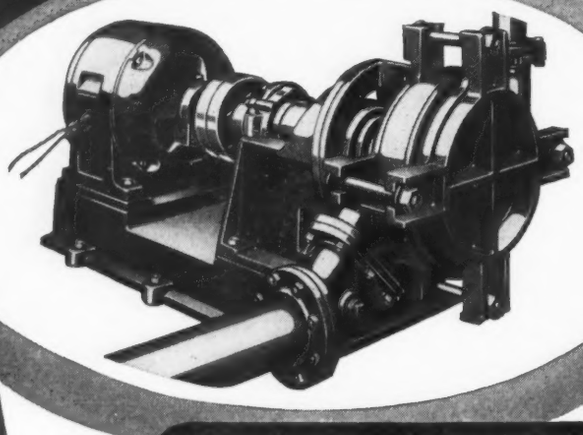
Call on your nearby A.C.F. Representative for help on your transportation problems. American Car and Foundry Company • New York • Chicago • Cleveland • Washington • St. Louis • Philadelphia • Huntington, W.Va. Berwick, Pa. • Pittsburgh • San Francisco

a.c.f. MINE CARS

for Greater Coal Output

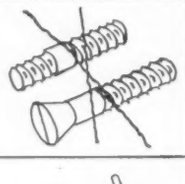
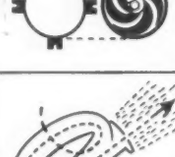
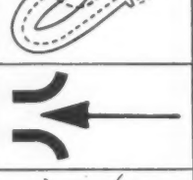
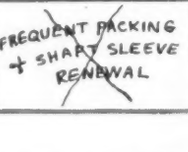
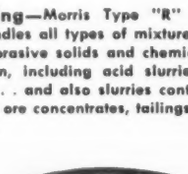
Helps avoid your biggest pump problems

Morris Type "R" Slurry Pump



Gives longer uninterrupted service

Ordinarily harsh abrasives wear out your pump. The corrosive action of acids eats away its utility. Time-consuming maintenance and repairs cut down your production. Now see why the Morris Type "R" helps avoid these problems.

1		**Simple design**—The Morris Type "R" has no internal studs and bolts. Nor does it have troublesome internal joints and fits. The Suction Disc Liner is merely *clamped* into position between disc and shell. *Fewer wearing parts means less maintenance and longer uninterrupted service.*
2		**Easily dismantled**—The impeller and shaft sleeve of the Morris Type "R" Slurry Pump can be renewed *without disturbing* the suction and discharge piping or the bearings. This means considerably less lay-up time.
3		**More abrasive resistant**—With the clamping effect of the bolts on the discs, the shell is not subject to high stress. Consequently, the shell can be made of a large variety of materials, including those of high abrasive resistance. Yet these materials need not necessarily be of high tensile strength.
4		**The hydraulic passages of the suction disc are extremely large and velocities are low. As a result, wear is minimized and renewal infrequent.**
5		**Stuffing box troubles are practically eliminated because the suction gland is under low suction pressure only.**

For Mining—Morris Type "R" Slurry Pump handles all types of mixtures containing abrasive solids and chemicals in suspension, including acid slurries and sludges . . . and also slurries containing soda ash, ore concentrates, tailings, slag, coal, etc.

MORRIS Type "R" SLURRY PUMP

More easily maintained . . . more easily dismantled . . . more hours of continuous service. Proved by 84 years' Morris experience in pump building.

MORRIS CENTRIFUGAL PUMPS
MORRIS MACHINE WORKS
BALDWINSVILLE, N. Y.
Offices in Principal Cities

3x¼-in. coal; capacity, 85 t.p.h.; R&S Hydro-Separator coal-washing equipment to be used.

Feds Creek Coal Co., Inc., Biggs, Pike County, Ky.—Contract closed with Roberts & Schaefer Co. for coal washing plant; capacity of plant, 500 t.p.h. of 5x0-in. coal; washing capacity, 275 t.p.h. of 5x½-in. coal; R&S Hydro-Separator to be used.

Consolidation Coal Co. (Ky.), Hendrix mine, Deane, Ky.—Contract closed with Roberts & Schaefer Co. for preparation plant; capacity, 200 t.p.h. run-of-mine, crushed to 6 in.; all to be washed in Link-Belt Baum jig, with multi-louvre dryers and Bird centrifugal filters used for drying the fine coal.

West Virginia Coal & Transportation Co., West Columbia, W. Va.—Contract closed with Roberts & Schaefer Co. for coal preparation plant; capacity, 300 t.p.h. of 1½x0-in. coal; R&S Super-Airflow coal-cleaning units to be employed.

Carpentertown Coal & Coke Co., Mt. Pleasant, Pa.—Contract closed with Roberts & Schaefer Co. for washing plant; capacity, 100 t.p.h. of 1½x0-in. coal; Hydrotator coal-washing units to be used.

West Kentucky Coal Co., West Diamond mine, Earlington, Ky.—Contract closed with Roberts & Schaefer Co. for preparation plant; capacity, 500 t.p.h. cleaning 6x0-in. coal; R&S Hydro-Separators for coarse sizes and R&S Hydrotators for fine sizes to be employed.

Brookside-Pratt Mining Co., Nauvoo mine, Birmingham, Ala.—Contract closed with the Jeffrey Mfg. Co. for a washing plant; 200 t.p.h. capacity; run-of-mine.

Hatfield-Campbell Creek Coal Co., Point Lick, W. Va.—Contract closed with the Jeffrey Mfg. Co. for addition to washing plant; 350 t.p.h. capacity; 8x0-in. coal.

Ethel Chilton Mines, Inc., Ethel, W. Va.—Contract closed with K. Prins & Associates for additional coal-washing facilities; 100 t.p.h. Prins Coal Washer, one double-deck Allis-Chalmers vibrating screen and conveyors for loading and mixing; 5x1¼-in. coal.

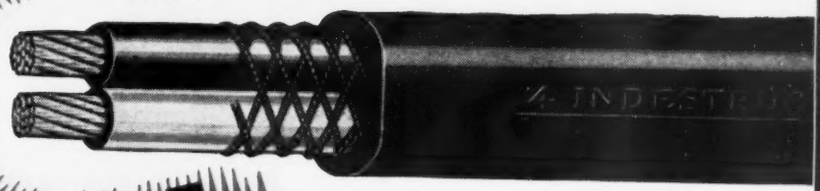
Gravity Coal Co., Avoca, Pa.—Contract closed with Deister Concentrator Co. for one SuperDuty Diagonal-Deck coal-washing table and one Concenco revolving feed distributor arranged for three-way distribution.

Allerman & Schoener, Schuylkill Haven, Pa.—Contract closed with Deister Concentrator Co. for one SuperDuty Diagonal-Deck coal-washing table.

Boothton Coal Mining Co., Boothton, Ala.—Contract closed with Deis-

National Electric Indestructo MINING MACHINE CABLES

The New NE Indestructo Parallel Duplex Cable



DEPENDABLE SERVICE

"INDESTRUCTO" Mining Machine Cables are SAFE Cables. Their fire-resistive qualities far surpass the flame standards set by Pennsylvania Act No. 206 (NE Approval No. P-106) and Federal Mine Safety Code.

National Electric "INDESTRUCTO" Mining Cables are especially designed and built to withstand the abuse encountered in mechanized mining.

The heavy sheath of lead-cured NEOPRENE provides long life and maximum safety under severe operating conditions. A skeleton seine-twine braid bonds the conductor insulation and the NEOPRENE sheath, resulting in a cable of tough and rugged construction.

There's a suitable type of "INDESTRUCTO" Cable or Cord for every mechanized unit used in mines. See "MINING CATALOGS" for complete listing, or let us send you our illustrated catalog.

Neoprene Jacketed

COMBATS

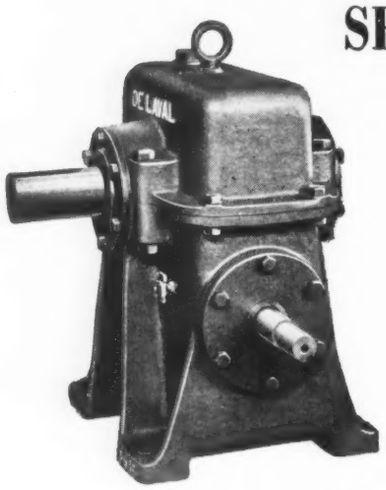
- HEAT
- FLAME
- ABRASION
- SOIL ACIDS
- MINE WATER
- OIL AND GREASE
- CORROSIVE VAPORS

NATIONAL ELECTRIC PRODUCTS — WIRING SYSTEMS — WIRES AND CABLES

National Electric
PRODUCTS CORPORATION
PITTSBURGH 30, PA.

DE LAVAL GEAR REDUCERS *in* STOCK

CRATED FOR IMMEDIATE SHIPMENT



These popular units are assembled, crated and ready for immediate shipment.

Reducer	*Ratio*	*Probable *HP Motor*	*Reducer*	*Ratio*	*Probable *HP Motor*
BW400	92⅔	5	BW600	112⅔	10
BW400	19½	3	BW600	19½	7.5
BW400	25	2	BW600	25	5
BW400	40	1.5	BW600	40	3
BW500	112⅔	7.5	BW700	92⅔	15
BW500	19½	5	BW700	19½	10
BW500	25	3	BW700	25	7.5
BW500	60	1.5	BW700	40	5

** Based on 1750 rpm—A.G.M.A. Class 1 Service. For other rpm's or Service refer to De Laval rating tables.*

Other sizes and ratios, in both single and double reductions, and in vertical and horizontal drives, also can be furnished promptly.

PHONE FOR QUICK SERVICE TO THESE
DE LAVAL SALES OFFICES

Atlanta, Ga. Walnut 8890
Boston, Mass. Liberty 2-5993
Charlotte, N. C. Charlotte 3-7549
Chicago, Ill. Harrison 3290
Cincinnati, Ohio Dunbar 4654
Cleveland, Ohio Henderson 7500
Denver, Colo. Main 0697
Detroit, Mich. Madison 0950
Houston, Texas Wentworth 3-2823
Indianapolis, Ind. Albert 9433
Kansas City, Mo. Harrison 0744
Los Angeles, Calif. Michigan 6003
New Haven, Conn. New Haven 8-3459
New Orleans, La. Raymond 0228
New York, N. Y. Bowling Green 9-1550
Philadelphia, Pa. Rittenhouse 6-8086
Pittsburgh, Pa. Court 5400
Rochester, N. Y. Stone 6950
St. Paul, Minn. Garfield 1836
Salt Lake City, Utah Salt Lake City 3-7933
San Francisco, Calif. Sutter 3426
Seattle, Wash. Elliott 3437
Tulsa, Okla. Tulsa 5-2151
Washington, D. C. National 9238

(WG-22)

DE LAVAL STEAM TURBINE CO.
TRENTON 2, NEW JERSEY

ter Concentrator Co. for one Concenco revolving feed distributor.

International Coal & Coke Co., Coleman, Alta., Canada—Contract closed with Deister Concentrator Co. for one SuperDuty Diagonal-Deck coal-washing table.

•

Association Activities

The Pennsylvania Anthracite Section, American Institute of Mining and Metallurgical Engineers, at its annual summer meeting, elected the following officers for the coming year: chairman, W. B. Geise, Susquehanna Collieries Co.; vice chairman, George A. Roos, Philadelphia & Reading Coal & Iron Co.; secretary-treasurer, Floyd S. Sanders, Goodman Mfg. Co. Also, the following members of the executive committee were named to serve for the three-year terms: Walter Petzold, The Hudson Coal Co.; Earl Lamb, Moffat Coal Co.; Harry Montz, Lehigh Valley Coal Co.; Wilmot Jones, Jeddo-Highland Coal Co.; and D. C. Helms, Lehigh Navigation Coal Co.

The Colorado and New Mexico Coal Operators Association elected the following officers at its meeting in Denver, June 23: president, George B. Dick, president, Butte Valley Coal Co., Walsenburg, Colo.; vice president, J. S. Besser; second vice president, S. M. Thompson; secretary-treasurer, O. F. Bridwell.

Virginia Coal Operators Association at its 29th annual meeting, July 16, reelected all officers as follows: president and secretary, George H. Esser; vice president, H. W. Meador; assistant secretary, E. H. Robinson. All members of the board of directors likewise were reelected.

•

New Developments

• Close to 5,000 tons a day from Mine No. 15-A, already in production, and from Mines Nos. 28 and 29, still under development, soon will be passing through the tipple and preparation plant of Mine No. 28, Island Creek Coal Co., Holden, W. Va. The operations are located on Mud Fork, almost directly west of Logan. Coal from all three mines comes from the Eagle seam. Chance cones will prepare the coal for market when the preparation plant is completed. The 5-in. and ⅛-in. products will be loaded separately, the smaller size not being beneficiated. Pending completion of the Mine No. 28 preparation plant and full development of Mines Nos. 28 and 29, coal from Mine No. 15-A will continue to be hauled in mine cars to Mine No. 16 preparation plant.

• The Barnes & Tucker Co., Barnesboro, Pa., is reported to have taken over a large acreage of high-grade

Improved distribution for STOODY Hard-Facing Alloys

TO PROVIDE more effective coverage, better service and additional technical assistance in the use of hard-facing alloys, Stoody Company announces certain changes in its distributor organization. The accompanying list contains the names of principal distributors throughout the United States and Canada.

IN ADDITION TO THESE DISTRIBUTORS, *local dealers in industrial and agricultural areas handle Stoody products. For the name of your local dealer, write or phone the distributor nearest you.*

STOODY DISTRIBUTORS IN THE UNITED STATES AND CANADA

ALABAMA
Birmingham, POST WELDING SUPPLY COMPANY
ARKANSAS
Little Rock, WELDERS SUPPLY COMPANY
CALIFORNIA
Fresno, VICTOR EQUIPMENT COMPANY
Los Angeles, VICTOR EQUIPMENT COMPANY
L. J. PADDOCK COMPANY (Los Nietos)
Oakland, VICTOR EQUIPMENT COMPANY
San Diego, VICTOR EQUIPMENT COMPANY
San Francisco, VICTOR EQUIPMENT COMPANY
COLORADO
Craig, THE DENVER OXYGEN COMPANY
Denver, THE DENVER OXYGEN COMPANY
WESTERN OXYGEN COMPANY
Durango, WESTERN OXYGEN COMPANY
Grand Junction, THE DENVER OXYGEN COMPANY
Pueblo, WESTERN OXYGEN COMPANY
FLORIDA
Jacksonville, DUVALL WELDING SUPPLY COMPANY
Miami, MIAMI WELDING SUPPLY, INC.
Tampa, GENERAL ENGINEERING & MACH. CO., INC.
GEORGIA
Atlanta, PYE-BARKER WELDING SUPPLY COMPANY
ILLINOIS
Chicago, C. E. PHILLIPS & COMPANY
KANSAS
Hutchinson, KOPPER SUPPLY CO., INC.
LOUISIANA
Baton Rouge, LOUISIANA WELDING SUPPLY COMPANY
New Orleans, GULF WELDING EQUIPMENT CO.
Shreveport, PEERLESS SUPPLY COMPANY, INC.
MARYLAND
Baltimore, SOUTHERN OXYGEN COMPANY, INC.
Bladensburg, SOUTHERN OXYGEN COMPANY, INC.

MICHIGAN
Detroit, C. E. PHILLIPS & COMPANY
MINNESOTA
Duluth, W. P. & R. S. MARS COMPANY
Minneapolis, MINNESOTA WELDING SUPPLY COMPANY
Willmar, PARSONS WELDING SUPPLY CO., INC.
MISSOURI
Kansas City, KIRK-WIKLUND & COMPANY
MONTANA
Billings, MONTANA STEEL & SUPPLY COMPANY
Great Falls, MONTANA STEEL & SUPPLY COMPANY
NEBRASKA
Omaha, THE BALBACH COMPANY
OMAHA WELDING COMPANY
NEW MEXICO
Albuquerque, INDUSTRIAL SUPPLY COMPANY
NORTH CAROLINA
Asheville, SOUTHERN OXYGEN COMPANY, INC.
Greensboro, SOUTHERN OXYGEN COMPANY, INC.
NORTH DAKOTA
Minot, SKOGLUND WELDING & SUPPLY COMPANY
OHIO
Cleveland, SCOTT-TARBELL, INC.
Youngstown, SCOTT-TARBELL, INC.
OKLAHOMA
Oklahoma City, CLOVIS GEE SUPPLY COMPANY
OREGON
Portland, J. E. HASELTINE & CO
PENNSYLVANIA
Philadelphia, SOUTHERN OXYGEN COMPANY, INC.
Pittsburgh, ORRWELD, INC.
Wilkes Barre, COMMERCIAL GAS CORPORATION
York, SOUTHERN OXYGEN COMPANY, INC.
SOUTH DAKOTA
Aberdeen, PARSONS WELDING SUPPLY CO.

TENNESSEE
Kingsport, SOUTHERN OXYGEN COMPANY, INC.
Knoxville, SOUTHERN OXYGEN COMPANY, INC.
Memphis, DELTA OXYGEN COMPANY, INC.
TEXAS
Beaumont, MAGNOLIA AIRCO GAS PRODUCTS CO.
Corpus Christi, MAGNOLIA AIRCO GAS PRODUCTS CO.
Dallas, MAGNOLIA AIRCO GAS PRODUCTS CO.
El Paso, MAGNOLIA AIRCO GAS PRODUCTS CO.
Fort Worth, MAGNOLIA AIRCO GAS PRODUCTS CO.
Houston, MAGNOLIA AIRCO GAS PRODUCTS CO.
Kilgore, BRAMBLETT & ALLEN WELDING SUPPLY
Lubbock, WEST TEXAS OXYGEN COMPANY
Odessa, WEST TEXAS OXYGEN COMPANY
San Antonio, MAGNOLIA AIRCO GAS PRODUCTS CO.
Stamford, WEST TEXAS OXYGEN COMPANY
Tyler, BRAMBLETT & ALLEN WELDING SUPPLY
Wichita Falls, MAGNOLIA AIRCO GAS PRODUCTS CO.
UTAH
Salt Lake City, WHITMORE OXYGEN COMPANY

VERMONT
Burlington, GRADY'S WELDING SUPPLY
VIRGINIA
Norfolk, SOUTHERN OXYGEN COMPANY, INC.
Richmond, SOUTHERN OXYGEN COMPANY, INC.
Roanoke, SOUTHERN OXYGEN COMPANY, INC.
WASHINGTON
Seattle, J. E. HASELTINE & CO.
Spokane, GIBSON WELDING SUPPLIES
WEST VIRGINIA
Bluefield, SOUTHERN OXYGEN COMPANY, INC.
Huntington, SOUTHERN OXYGEN COMPANY, INC.

★ ★ ★

ALBERTA, CANADA
Calgary, Edmonton, Lethbridge, PRECISION MACHINE & FOUNDRY, LTD.
BRITISH COLUMBIA
Vancouver, Victoria, New Westminster, McLENNAN, McFEELY & PRIOR LIMITED
ONTARIO, CANADA
Toronto, G. D. PETERS & CO. OF CANADA, LTD.
QUEBEC, CANADA
Montreal, G. D. PETERS & CO. OF CANADA, LTD

STOODY COMPANY

Short Cuts....

TO COST CUTS

Here's a book that is indeed timely . . . a book that discusses, quickly and to the point, present-day maintenance problems and offers as a solution "10 Proven Ways To Cut Mining Costs."

Those interested in maintaining normal profit levels, will find this book of utmost value. Just fill in the coupon. The book is yours for the asking.

KOPPERS

PRESSURE-TREATED WOOD

KOPPERS COMPANY, INC.

PITTSBURGH 19, PA.

KOPPERS COMPANY, INC., PITTSBURGH 19, PA.

Please send me your book "10 Proven Ways To Cut Mining Costs."

Name_____

Title_____

Company_____

Address_____

steam coal near Bakerton, Pa. The property, formerly owned by the McCombie Coal Co., will employ about 400 men. Plans also are being made for a large cleaning plant at the company's Lancashire No. 20 mine.

• Expenditures of at least $300,000 are being planned for machinery and equipment to operate a combined deep and strip mine on Smith Creek, near Sandy Hook, Ky., by the Kentucky-Eastern Coal Corp.

• Installation of a new conveyor belt system is reported to be half completed at the No. 3 mine of the Rail & River Coal Co., Dilles Bottom, Belmont County, Ohio. The belt installation is part of a $425,000 improvement program which also includes new cars and other equipment.

• The Perry Coal Co., O'Fallon, Ill., is developing a $500,000 slope with a 1,500-ft. belt to replace its shaft.

• A new mine on 200 acres of coal land is reported to be under development by the S. & S. Coal Co., near Herndon, W. Va.

• The Ken Coal Co., Galesburg, Ill., has opened its new Ken strip mine at Bixby, Ky. Capacity is 6,000 tons per day and life expectancy is 40 years. A complete mechanical cleaning plant has been installed.

• Cutshin Coal Co., Combs, Ky., is reported to be planning a new tipple and additions that will expand daily output to 2,200 tons.

• The Hammond Coal Co., Girardville, Pa., plans to develop the sixth level of its anthracite mine at a cost of $600,000. Work will begin late in 1948.

• A new strip mine in the Mammoth anthracite seam was opened early this year by the Kohinoor Coal Co., Shenandoah, Pa. Daily capacity is 1,000 tons.

• Hill Bros. Coal Co., Allsport, Pa., opened a new strip mine with a daily capacity of 800 tons to 1,000 tons early in April.

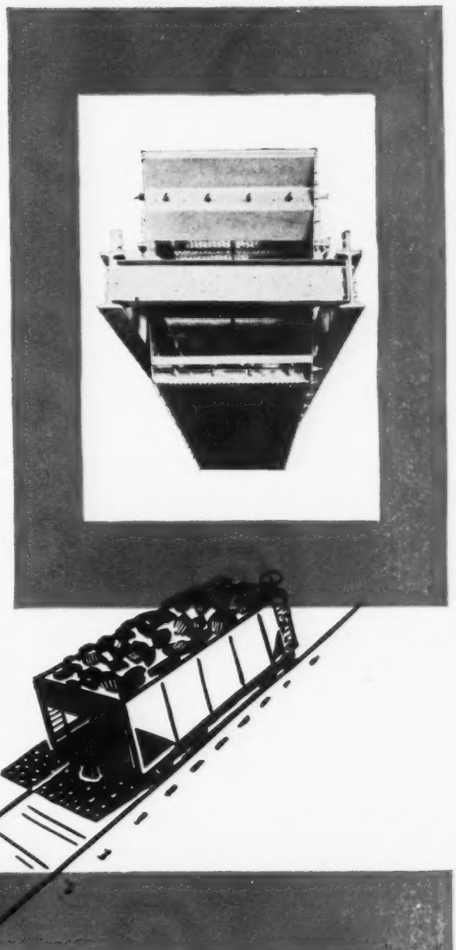
• Cumberland Collieries, Inc., Dunlap, Tenn., is opening the new Red Atomic strip mine, which will produce 1,200 tons daily from the Sewanee seam.

• The Jewell Ridge Coal Corp. expects to open about Sept. 1 a new slope mine at Oneida, Tenn. Output is expected to reach 700 tons daily by Jan. 1, 1949.

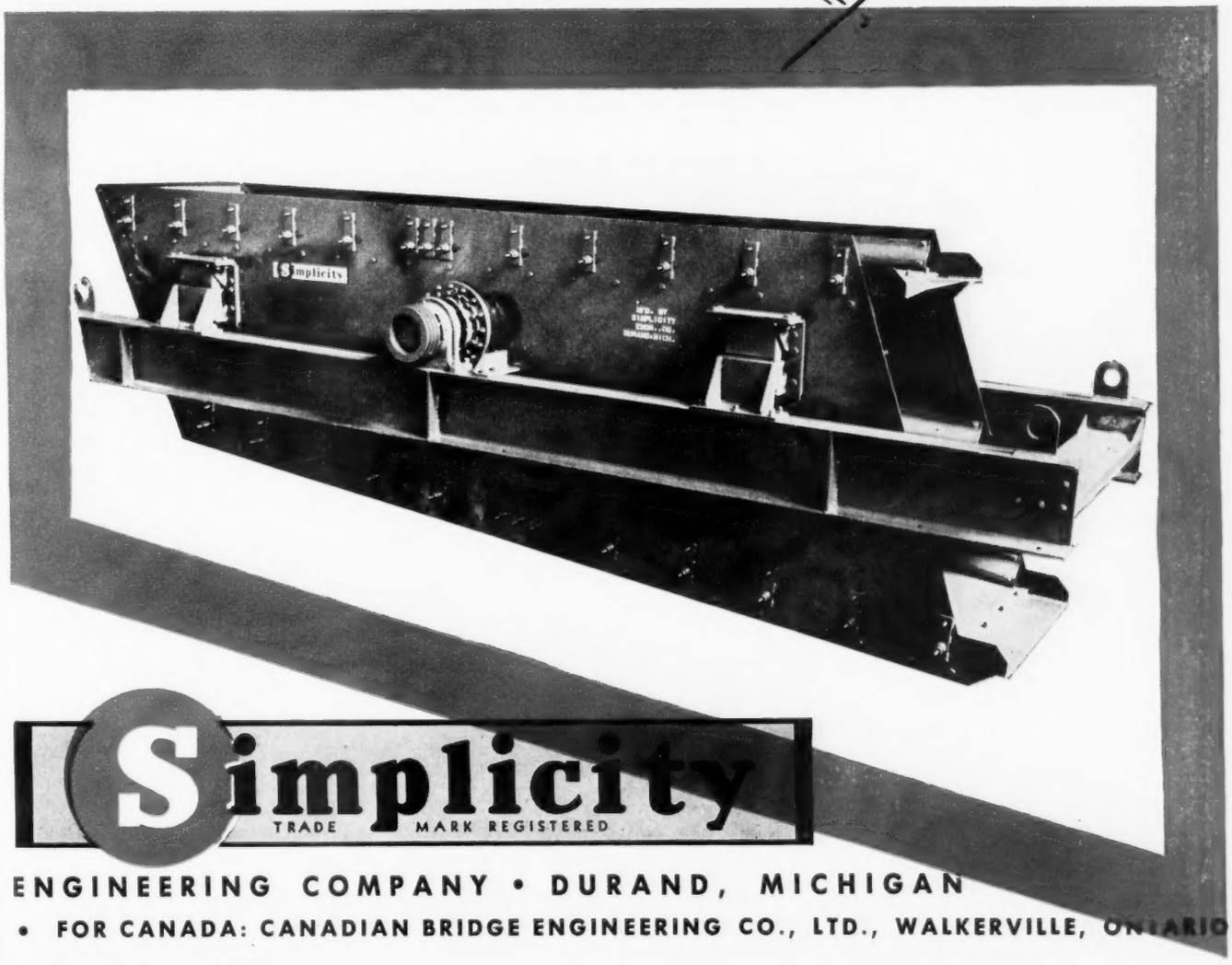
• The Red Power strip mine, Tennessee Valley Collieries, Inc., has been opened at Bryson Mountain, Claiborne County, Tenn., with a capacity of 1,000 tons daily.

• The Highland Coal Co., Clarksburg, W. Va., has opened the Highland No. 1 strip mine near Clarksburg and is

SIMPLICITY SOLVES THE DAMP COAL SCREENING PROBLEM . . .



For coal sizing this Simplicity 3′ x 12′ Model D 3-deck gyrating Screen can't be beat. The special Simplicity Ball-Tray Deck attachment keeps damp-coal moving right along and prevents building up on the wires of the screen cloth thereby eliminating "blinding." Small hard rubber balls in constant movement within the compartments of the Ball-Tray Deck, keep the screen cloth free at all times. Massive Simplicity construction, coupled with advanced Simplicity engineering, assures year-in, year-out dependability with absolute minimum maintenance and repair charges. Your nearby Simplicity representative will be glad to review your sizing and separating problems and recommend specific Simplicity Gyrating Screens that will speed production and profits for you.



Simplicity
TRADE MARK REGISTERED

ENGINEERING COMPANY • DURAND, MICHIGAN

• FOR CANADA: CANADIAN BRIDGE ENGINEERING CO., LTD., WALKERVILLE, ONTARIO

For more than sixty years Weir Kilby has been manufacturing good quality trackwork for Railways, Mines, and Industrial plants. As rolling stock and other apparatus have become heavier we have improved and strengthened our product to meet these new service demands. Our many customers are pleased with our good deliveries, reasonable prices and superior product. We will be glad to work with you. Many items, such as WEIR TITAN Frogs, Switches, Switch Stands, etc., can be shipped from stock. Other units will be made up promptly.

Suppliers to Mines and Railroads Since 1882

WEIR KILBY CORPORATION

CINCINNATI 12, OHIO Successors to BIRMINGHAM 7, ALA.

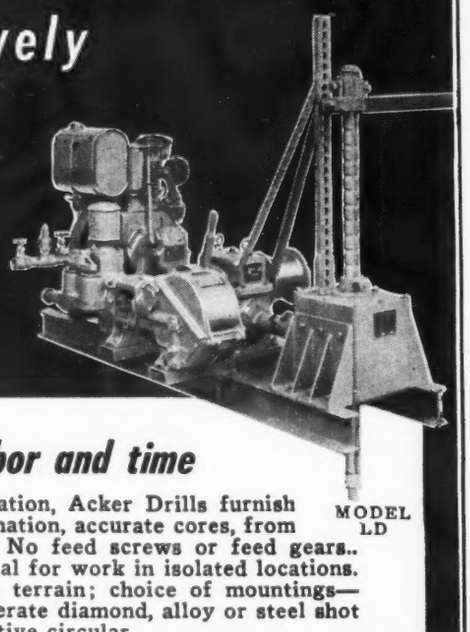
WEIR FROG CO. . . . KILBY FROG & SWITCH CO. . . . CINCINNATI FROG & SWITCH CO.

for instance **STRIP MINING** *in*

Know Positively

DEPTH of overburden

THICKNESS *and quality of* **COAL SEAM**



MODEL LD

for least cost, labor and time

Light weight, simple operation, Acker Drills furnish complete subsurface information, accurate cores, from 300 ft. maximum depths. No feed screws or feed gears.. Sturdy. Few parts . . . ideal for work in isolated locations. Easy to move over rough terrain; choice of mountings—truck, trailer or drag. Operate diamond, alloy or steel shot bits. Send for fully descriptive circular.

ACKER DRILL CO., SCRANTON 3, PA.

ACKER ROTARY CORE DRILLS

contemplating development of a deep mine on the same property. The strip mine produces 1,500 tons daily from the Pittsburgh seam.

• A new mine in the No. 5 Block seam is being planned for late in 1948 by Winifrede Collieries, Inc., Charleston, W. Va.

•

Virginia Miners Get Suspended Sentences

Ninety-seven union miners, indicted under Virginia's anti-lynch law, pleaded guilty to mob assault charges July 20 and were given five-year suspended sentences. Seventy-eight other miners were acquitted. The charges grew out of indictments drawn up by a special grand jury as a result of an attack on 10 persons at the strip-mining operation of the Gilliam & Hodges Co. at Grundy, Va. The prosecution was conducted by Attorney General J. Lindsay Almond Jr. on special orders from Governor Tuck of Virginia. State police blocked all roads leading to Grundy during the trial, closed the town's liquor stores and set up patrols in front of the courthouse, which was cleared of spectators to make room for the defendants.

Elsewhere, at Wise, Va., the trial of five men accused of feloniously assaulting a state trooper in the Carfax area was postponed until Aug. 6 because of the illness of the trooper, who had charged the five men with beating him, throwing him down an embankment and firing at him with his own gun when he went to investigate a disturbance June 27.

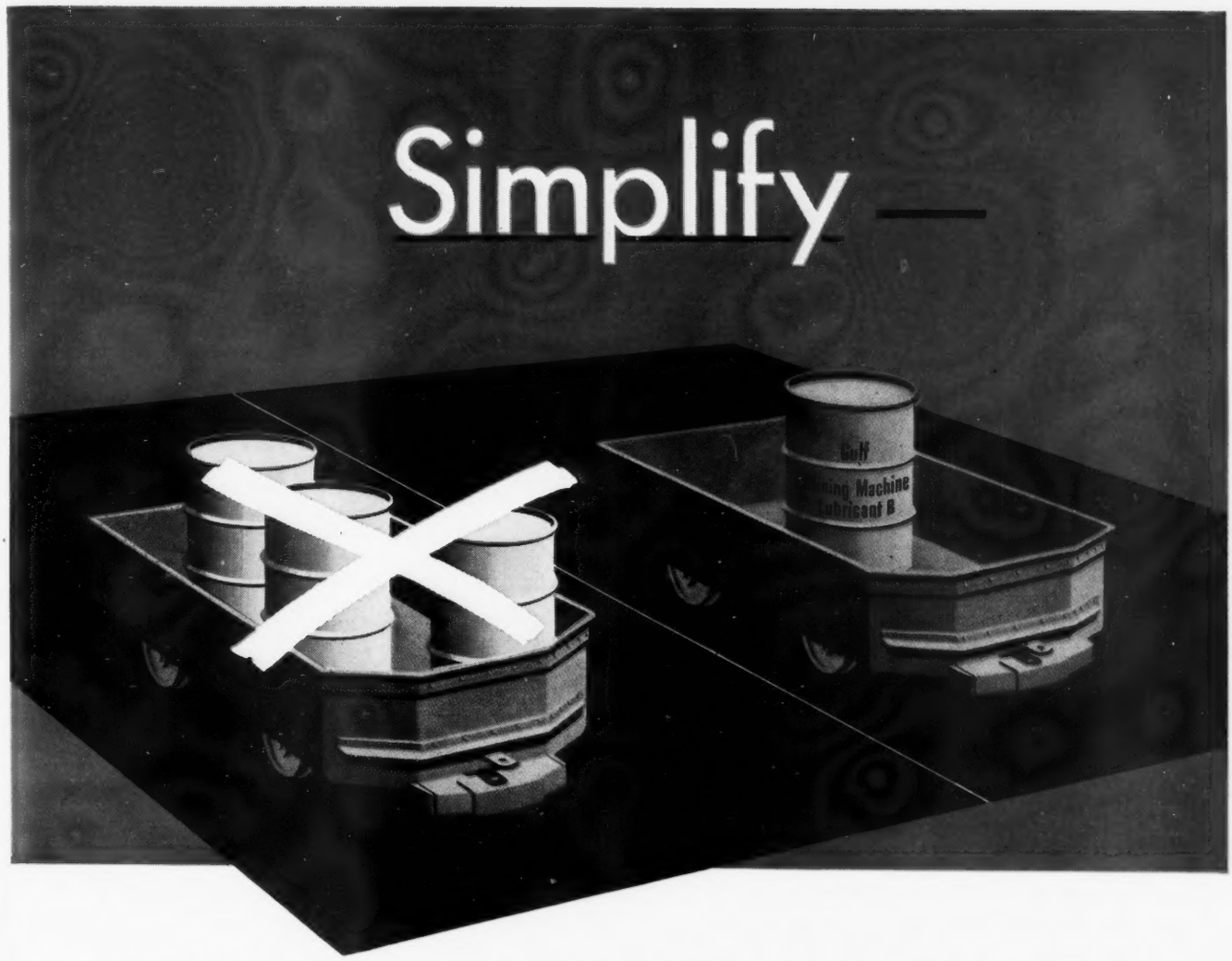
•

Pyrene Calls In Faulty Fire Extinguishers

The Pyrene Mfg. Co. has called in more than half a million hand fire extinguishers because of a corrosive agent, supplied by an outside manufacturer, which is damaging some of the recalled extinguishers. All extinguishers recalled are of the vaporizing, liquid pump type in 1-qt. and 1½-qt. sizes, plus a few of the 1pt. size. Company officials have promised replacements as fast as possible and urge owners to turn in recalled extinguishers to suppliers or to the company's Department RX, 10 Empire St., Newark 5, N. J. Faulty extinguishers bear Underwriters' Laboratories numbers on their metal plates as follows:

1½-Qt. Extinguishers

150781 to 150900	461331 to 478330
235486 to 235530	480481 to 494480
236731 to 237230	497631 to 504630
403106 to 404730	505631 to 509630
411998 to 414430	510256 to 518255
416631 to 419830	520356 to 520955
419931 to 449230	532356 to 533748
449631 to 458930	539856 to 544312
460931 to 461230	



Gulf Mining Machine Lubricant B

does the job of 2 or 3 other lubricants

—*and does it better!*

Here's effective help in your efforts to reduce maintenance costs and simplify lubricant storage and handling—from oil house to face! When you use Gulf Mining Lubricant B you can eliminate from 2 to 3 other lubricants depending on the type of equipment you operate. This means less confusion at the face, elimination of application mistakes, better lubrication.

At the same time Gulf Mining Machine Lubricant B provides better protection for cutting and loading machines: its heavy body means less leakage from gear cases; its superior lubricating value insures less wear; its exceptional adhesiveness prevents throwoff or channeling; and it resists the washing action of water.

Gulf Mining Machine Lubricant B is equally effective for plain and antifriction bearings and for gears in drives and transmission.

To get the many benefits possible with this quality product, and for expert help in other phases of improved lubrication, call in a Gulf Lubrication Engineer. Write, wire, or phone your your nearest Gulf office today.

Gulf Oil Corporation · Gulf Refining Company

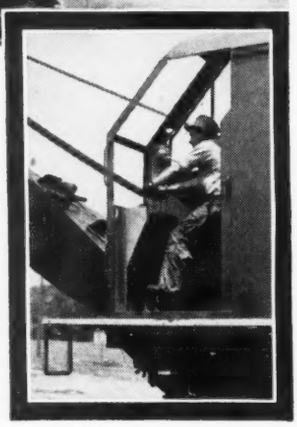
Division Sales Offices:

Boston · New York · Philadelphia · Pittsburgh · Atlanta
New Orleans · Houston · Louisville · Toledo

GULF INDUSTRIAL LUBRICATION

OSGOOD Air Control

FOR *Safe, Easy Operation*



Husky, powerful machines . . . built to handle the most difficult work . . . yet, with OSGOOD Air Control, operating an OSGOOD is simple and easy. A bank of four hand levers and two foot pedals, all within convenient reach of the operator, provides safe, positive control of the basic operations of an OSGOOD.

And OSGOOD Air Control is metered—giving an ease of operation that means more work, in less time, on any job. Write today for specifications.

POWER SHOVELS • CRANES • DRAGLINES • CLAMSHELLS • BACKHOES • PILE DRIVERS

THE OSGOOD CO. O-G THE GENERAL CO. EXCAVATOR

MARION OHIO

DIESEL, GASOLINE OR ELECTRIC POWERED • ¾ TO 2½ CU. YD. • CRAWLERS & MOBILCRANES

FLEXIPIPE

The improved flexible tubing for mine and tunnel ventilation

This flexible air tubing is ready for immediate, easy installation. On account of its flexibility, it can be put up or taken down in a fractional part of the time required by more rigid means of face ventilation.

Write for free sample and full information.

BEMIS BRO. BAG CO.

412 Poplar Street, St. Louis 2, Mo.

1-Qt. Extinguishers

R689558	to	R689997	T844550	to	T845050
R692644	to	R693497	T846551	to	T853350
R731288	to	R732363	T854051	to	T854700
R751698	to	R753697	T861051	to	T906880
T334485	to	T380550	T911051	to	T976216
T398671	to	T485550	T977051	to	T999999
T583051	to	T585050	U2	to	U27050
T585551	to	T601200	U33051	to	U33990
T601801	to	T676150	U37651	to	U38784
T676251	to	T680483	U64651	to	U79650
T680651	to	T711650	U80151	to	U100150
T712151	to	T792150	U150151	to	U152252
T793151	to	T843750			

Some extinguishers listed above recently were rebuilt and need not be returned. These are stamped around the outlet nozzle with the symbols A-48, B-48, etc., to L-48 or the letter "X."

All Pyrene fire-extinguisher liquid (refills) purchased from any source prior to Jan. 1, 1948, also should be returned for replacement but to a different address: Pyrene Mfg. Co., 560 Belmont Ave., Newark 8, N. J.

•

Scan Steel Needs of Bituminous Industry

The National Bituminous Coal Advisory Council has estimated the steel requirements of the domestic bituminous industry at 682,900 tons annually. The council's report was released July 14 by Secretary of the Interior J. A. Krug. The steel requested by the council is based on an anticipated annual output of 620,000,000 tons of bituminous. Of the total steel tonnage requested, 306,700 tons is for mine machinery and repair parts; 376,200 tons for underground and stripping supplies. The report, citing use of 513,200 tons of steel in 1943 with coal production totaling 590,000,000 tons, points up postwar trends in mining methods, notably the growth in mechanization of deep mines, resulting in an increased demand for cutters, loaders, drills, crushers and related equipment, as well as a heavy increase in strip mining. The council gave special stress to the need for heavier rails for underground transportation and the increasing use of steel timbering.

After further study by the Department of the Interior, the council's report will be forwarded to the Office of Industry Cooperation of the Department of Commerce with a request that as much steel as is needed to maintain scheduled output be allocated to the industry.

•

Welfare Fund Plans 200-Bed Miners' Hospital

Establishment of a large medical center for injured coal miners is being studied by the medical advisory board, U.M.W.A. Welfare and Retirement Fund. Preliminary studies are based on a 200-bed hospital, costing from $13,000 to $20,000 a bed and staffed by eminent specialists in various fields. Dr. R. R. Sayers, medical director of the welfare fund and form-

NEW LONG "400" SUPER CHAIN CONVEYOR

PATENTED & PATENTS PENDING

No bent or broken flights

with

LONG "SUPERFLITE" Conveyor Chain

In six states "400" SUPER Chain Conveyors are now in use—setting new standards for continuous production, low maintenance and ease of handling . . . and with the LONG SUPERFLITE Conveyor Chain (see illustration) there are no bent or broken flights.

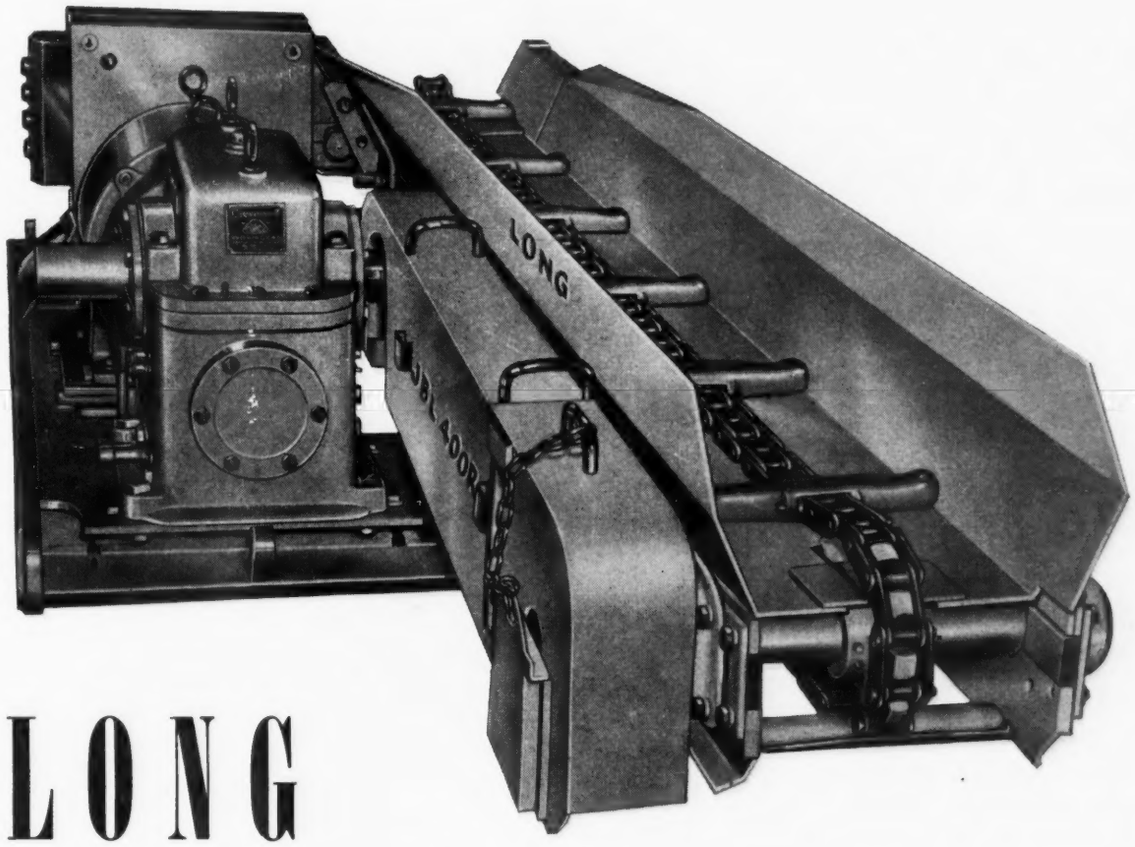
The LONG 400 Series includes the 400 R Room Conveyor —400 F Face Conveyor—400 U Utility Conveyor—400 F E Elevator and 400 G Gathering Conveyor.

Write for information on "400" Conveyors, and on the SUPERFLITE Chain. Both are designed with strength equal to continuous production.

Address Inquiries to

LONG SUPER MINE CAR COMPANY

Fayetteville, W. Va.



LONG

SUPER MINE CAR COMPANY

●

FAYETTEVILLE, W. VA.

Early Delivery on Complete Conveyors.

Immediate Delivery on Conveyor Chains.

PROMET
THE Engineered BRONZE
BEARINGS

Cost less because they wear longer—wear longer because of a specific formula for every requirement.

AXLE BEARINGS, JOURNAL LINERS, BUSHINGS, AND WEARING PARTS. FOR GENERAL ELECTRIC, SULLIVAN, WESTINGHOUSE, GOODMAN, OLDROYD, JOY, JEFFREY EQUIPMENT.

PROMET BABBITT
Lead or tin base. 3 grades.

PROMET BAR STOCK
Round, hexagon, square. Rough case, semi-finished. Cored stock all sizes (by 1/8" steps) from 1/2" minimum core to 12" O.D. and 12" lengths. 6 grades of hardness.

WRITE FOR FREE FOLDERS

THE AMERICAN CRUCIBLE PRODUCTS CO., 1307 Oberlin Ave., Lorain, Ohio, U. S. A.
Prompt deliveries can usually be made from stocks maintained at
BECKLEY, W. VA., The Universal Supply Co. 1207 S. Kanawha St. . . . . Phone 7307
LORAIN, OHIO, The American Crucible Products Co. Phone 6983
Other Representatives
ALTON, ILL., Frank E. Rhine, 623 Blair Ave. . Phone 3-8624
BIG STONE GAP, VIRGINIA C. P. Cawood . . . Box 290
BIRMINGHAM 3, ALA. F. B. Keiser, Jr., 1309 First National Bldg. . Phone 7-2383
MT. LEBANON, PA., J. E. Nieser 720 Roselawn Ave. . . . . Phone LE-9875
NEW YORK CITY, Trans American Commerce Co., Inc., 165 Bdwy., ... Phone COrtlandt 7-4340
WILLIAMSON, W. VA., Williamson Supply Co. Phone 1200

336 *Femco* TROLLEY-PHONES
installed in mines in the past twelve months

CONSTANT SUPERVISORY CONTROL
through
CONTINUOUS COMMUNICATION
from mine-mouth to face...

INCREASES TONNAGE
Pays for itself very soon
PROMOTES SAFETY
Quick reports—quick action
SPEEDS OPERATIONS
No stopping to telephone
ACCEPTED AND APPROVED
By men who mine

You talk in a natural voice to any moving or stationary location anywhere in the mine.

Each station is equipped with a PRESS-TO-TALK MICROPHONE and a rugged, compact speaker.

Ask for demonstration
FARMERS ENGINEERING AND MANUFACTURING CO.
549 BRUSHTON AVE. · PITTSBURGH 21, PA. · CHurchill 5050
Specialists in Underground Radio Electronics

er director, U. S. Bureau of Mines, is in charge of the program.

Meanwhile, treatment of 100 miner paraplegics—men paralyzed from the waist down in mine accidents—is being carried on at Post-Graduate Hospital and Lenox Hill Hospital, New York City; the Kessler Clinic, Newark, N. J.; and the Permanente Foundation Hospital, Vallejo, Calif. About 300 more miners are awaiting treatment, it is reported.

•

Schuylkill Dredging to Begin in July

First dredging operations to clear silt from the Schuylkill River will take place late in July near Reading, Pa., it was announced recently by Milo F. Draemel, Pennsylvania Secretary of Forests and Waters. The dredging operation will be done with four huge electrically-driven dredges capable of removing thousands of tons of silt daily from the river. It is estimated the entire task of cleaning the river will cost about $52,000,000 and will be completed by 1951. The state already has appropriated $10,000,000 and will be asked for an additional $25,000,000. The Army is expected to provide the remaining $17,000,000 needed for the program.

•

Dan Harrington Earns Special Holmes Award

Dan Harrington, recently retired chief, Health and Safety Division, U. S. Bureau of Mines, has been awarded a special safety medal and certificate of honor by the Joseph A. Holmes Safety Association in recognition of more than 40 years' service in the promotion of health and safety in the mineral and allied industries. The award was presented in special ceremonies led by James Boyd, Director, U. S. Bureau of Mines. Mr. Harrington's citation was proposed at the 1948 meeting of the board of directors of the Holmes Association, who also elected him to life membership in the organization.

Mr. Harrington's certificate of honor was inscribed as follows: "Daniel Harrington, whose unselfish devotion to and leadership in the cause of safety in the mineral industries, for a period of more than four decades, has resulted in continuous advancement toward the goal of accident-free operation. He carries with him in his retirement the heartfelt and gracious thanks of all the extractive industries."

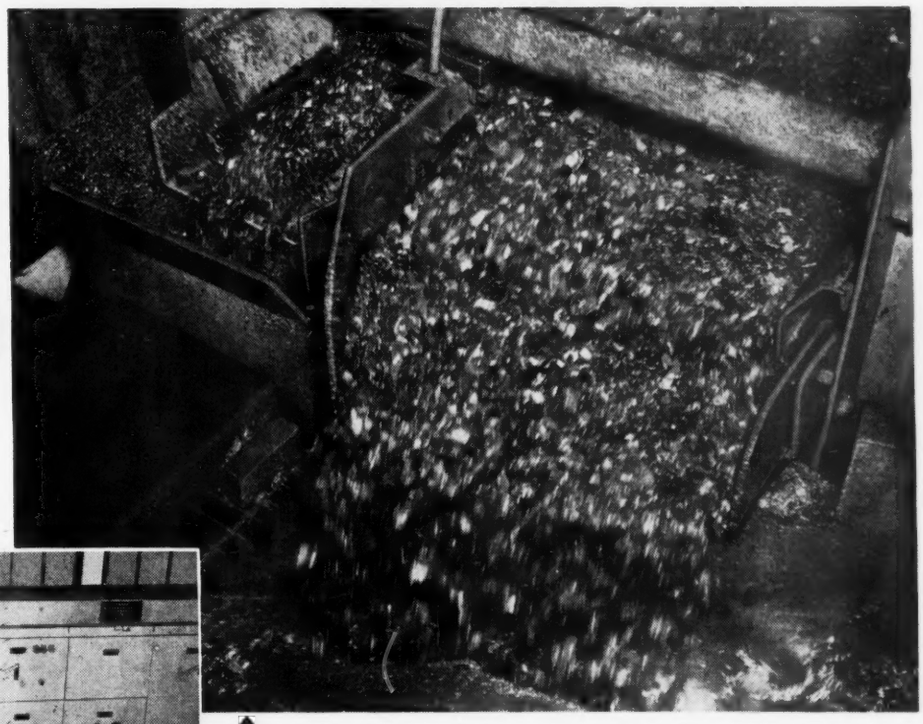
•

Court Slashes Local Coal Taxes

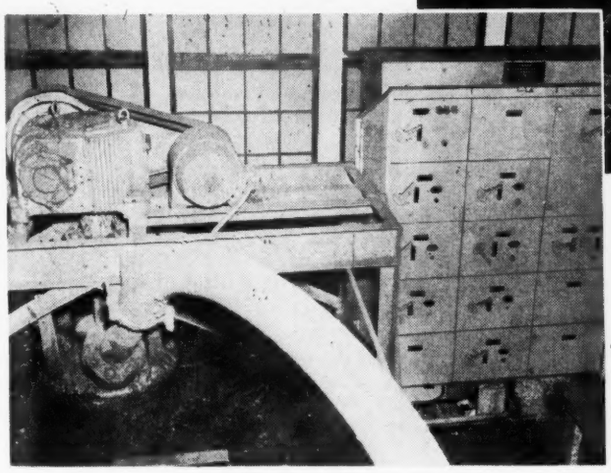
Coal taxes levied by two district school boards were cut in half or more by the Cambria County, Pa., court July 19 in a decision holding that the

NOW! WKE (HMS) "MOBIL-MILL"

a compact, prefabricated coal cleaning PLANT



Interior view of "Mobil-Mill" section showing final washed coal and refuse materials being discharged from heavy medium drainage washing screen.



Section of "Mobil-Mill" illustrating heavy medium separation vessel in foreground for production of separate coal and refuse products. Note centralized electrical control panel at right.

Ideally suited for production of low-ash coal products and elimination of refuse, "Mobil-Mills" are prefabricated for quick, economical installation. Now operating as complete cleaning units, these packaged plants easily fit into the breaker flow diagram between the breaker crushing circuit and the product disposal section. Sharp, closely controlled separations are effected by using magnetite as a heavy medium. Investigate this low-cost machine for efficient coal cleaning.

Rent or Buy

4 SIZES

5-15 TPH Feed
15-35 TPH Feed
35-90 TPH Feed
90-125 TPH Feed

Also designs and construction of HMS plants for any tonnage requirements.

Write WEMCO for details of coal cleaning economies now possible with "Mobil-Mill."

WEMCO

760-760 [illegible], CALIF.

LOS ANGELES • SACRAMENTO • SALT LAKE CITY • SPOKANE • POCATELLO, IDA. • DENVER • PHOENIX • CHICAGO • HIBBING • BARTOW, FLA. • NEW YORK

Coal Spirals • "S-H" Classifiers • Thickeners • Conditioners • Agitators • HMS Separatory Vessels • HMS Sand Pumps • HMS Thickeners • HMS Densifiers • WKE (HMS) "Mobil-Mills" • HMS Medium Pumps

WHY do so many superintendents specify MESCOWELD when it's time to order rail bonds? Because MESCOWELD Rail Bonds can be depended upon for maximum conductivity and long life. They feature our patented Flashwelding process for attaching bond to cable, assuring a more oxygen-free weld. **18 types are available for immediate delivery.**

Write for details

M8-F
All-Purpose Bond

MOSEBACH ELECTRIC & SUPPLY COMPANY
1115 ARLINGTON AVE. · PITTSBURGH 3, PA.
Phone: HEmlock 8332

COAL OPERATORS CASUALTY COMPANY

Specialists in Workmen's Compensation for the Coal Mining Industry

COAL OPERATORS CASUALTY COMPANY
THE SYMBOL OF SERVICE FOR COMMERCE AND INDUSTRY

HOME OFFICE
GREENSBURG, PENNSYLVANIA

taxes were producing excessive revenues. The levy of 5c. per ton imposed by Black Lick Township was cut to 2½c. and Elder Township's tax was cut to 2c. The taxes had become effective July 5. Estimates indicated that the Black Lick levy on 1,310,000 tons of coal expected to be mined in one year would have raised $60,000 as compared with the school budget of $29,000, and that the revenue in Elder Township would have been even more out of proportion.

•

Foreign Developments

London—A plea to miner delegates at the annual meeting of the National Union of Mineworkers to give Britain 200,000 more tons of coal a week has been sounded by Foreign Secretary Ernest Bevin, who thus indicated the importance of coal to the nation's foreign policy. Mr. Bevin's plea came on the heels of the fourth successive weekly drop in coal output.

It was officially announced later that the industry had showed a net loss of about $93,000,000 in the first year of nationalization. However, the NCB reported July 19 that it had earned a profit of slightly over $2,000,000 in the first quarter of 1948 after interest charges and other interim income commitments. Total industry profits came to about $17,400,000, of which over $15,000,000 represented colliery profits.

Earlier, the National Coal Board announced availability of 100 university scholarships to 18-year-old boys leaving school and young men already in the industry. Awards will cover the full cost of university fees and residence up to $1,200 a year and will include allowances for wives and children of students coming from the industry.

Meanwhile, it was made known that American engineers invited by the NCB to advise on mechanization already had started work and had suggested rapid tunnel-driving equipment in the East Midlands fields and shaft muckers to replace handloading in some pits.

South Africa—The Transvaal coal industry has contracted to supply 180,000 tons of coal to New Zealand at the rate of 9,000 tons a month. The fuel will be used principally by railroads. At the same time, it was announced that 100,000 tons will be sent to Victoria, Australia, with the

Stripping overburden at Hanna Coal Company with ESCO 4½-yard Cast-Welded Dipper on High-Lift model 2000 Lima.

STRIPPING GOES FASTER when *ESCO* cast-welded dipper buckets do the job. Production records prove it. The reason is simple —

ESCO cast-welded dipper buckets have no "deadhead" weight, carry greater payloads with every pass, make more passes every hour.

Excess Weight Eliminated

Hollow back-beam construction reduces weight while actually increasing strength. Wearing parts are made of wear-resistant manganese steel, need not be made excessively heavy to allow for wear.

Fast Digging Design

Clean cutting front with integral tooth bases and flaring outside teeth give clean, full bite. Tapered box provides quick, complete load discharge.

Long Service Life

Strain is distributed evenly throughout the bucket. *ESCO* Manganese Steel is used for all parts subject to wear and shock. This steel becomes highly polished with use, grows harder and tougher the more it works.

ESCO Buckets Will Make Money for You

ESCO dipper buckets are made in three types—coal loading dippers, cast-welded for general purpose work, and All-Cast manganese steel buckets for extremely severe service. Dragline buckets are available in four types—medium, stripping, standard and heavy duty. Whatever your requirements may be, one of these buckets will do your job quickly, economically and with a minimum of maintenance and "down" time.

Arrange with your nearest *ESCO* representative to see these buckets, or fill in and mail the coupon for complete information. Electric Steel Foundry, 2179 N.W. 25th Avenue, Portland 10, Oregon; 728 Porter Street, Danville, Illinois. Offices in Eugene, Oregon; Chicago; Honolulu; Los Angeles; New York; San Francisco; Seattle; Spokane. In Canada, *ESCO* Limited, Vancouver, B.C.

ELECTRIC STEEL FOUNDRY
2179 N.W. 25th Ave., Portland 10, Oregon

Please send information on: ☐ Cast-Welded Dipper ☐ Coal Loading Dipper ☐ All-Cast Dipper ☐ Medium Dragline ☐ Stripping Dragline ☐ Standard Dragline ☐ Heavy Duty Dragline.

Name_____

Address_____ Zone_____

City_____ State_____

ESCO

DRAGLINE and DIPPER BUCKETS

A New Locomotive Backed by 25 Years' Experience in the Battery Locomotive field!

GREENSBURG
"RANGER" STORAGE BATTERY
LOCOMOTIVES

All Locomotives
CUSTOM-BUILT
to your requirements

FEATURES

Oil-tight, leak-proof transmission. Use regular auto oil; change every 6 months.

Strong. Simple. Low maintenance cost.

Extra-long journal springs assure better trackability.

Large motor, to assure more horse power per ton weight of locomotive.

Can be equipped with hydraulic brake.

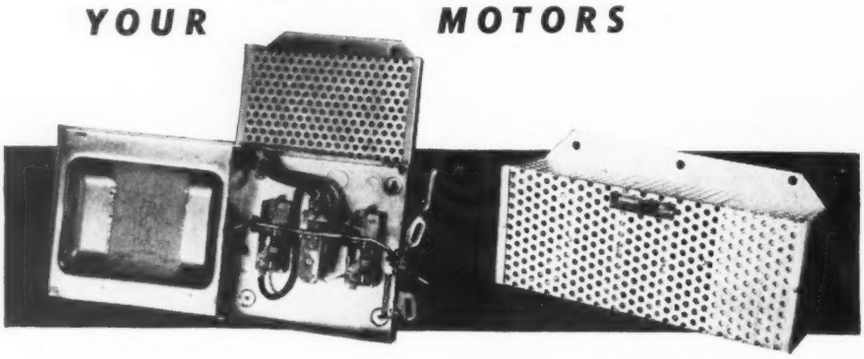
This locomotive being used for main line haulage at the Blacksmith Coal Company, Novinger, Missouri. This is a 4½ ton locomotive, operating on 30" gauge track. This locomotive built from 3½ to 10 tons – either single or double motor drive – 16" to 56½" track gauge.

MORE HAULING FOR LESS STORAGE BATTERY CAPACITY

THE GREENSBURG MACHINE CO.
Makers of Custom-Built Storage Battery Locomotives
101 STANTON ST., GREENSBURG, PA.

SMOOTH STARTS with GUYAN

D. C. STARTERS MEANS LONGER TROUBLE-FREE SERVICE FROM YOUR MOTORS



GUYAN TYPE MMS MOTOR STARTER
Manually operated — automatically makes armature-to-line connection at proper speed to insure smooth starts after power disruptions. Solderless lug connections.

GUYAN TYPE CMS MOTOR STARTER
Limits initial inrush of current—permits smooth starts—prevents arcing. Requires no operator. Similar to type MMS except for omission of manually operated starting switch.

Write for bulletins

GUYAN MACHINERY CO. LOGAN, W. VA.

first shipment of 5,000 tons expected by the end of July. Earlier, news of two new mines pointed to increased output of coal. The Blesbokfontein Colliery, South Witbank Coal Mines, Ltd., has gone into production with cutters, loaders and conveyors supplied by British manufacturers and the Raleigh Colliery, in the Middelburg district, announced that it expects to produce 1,500 tons a day by the end of 1948.

Moscow—The port of Settin is being reconstructed to handle 5.5 million tons of export coal from Poland next year and shipyards at Gdynia are building 2,500-ton colliers to move coal from Poland to western European nations.

A group of engineers in the western coal fields recently were awarded a Stalin Prize of 150,000 rubles for completing rehabilitation of 227 Donbass mines two years ahead of schedule. Also, an award was given to a group of coal-machinery engineers in the eastern fields for devolping a new type of machine that undercuts, breaks down and loads coal onto a conveyor.

Tokyo—Japanese coal output for the first two months of the fiscal year has fallen 9.1 percent below the quota. Under pressure from occupation officials, however, miners and management have agreed to work Sundays, holidays and overtime to make up the deficit before the end of the year.

Melbourne—The Australian Coal Board has invited foreign experts to advise on pillar extraction, underground storage and subsidence. Mining authorities and miners in Australia have opposed use of machines for pillar extraction, believing the operation to be dangerous, and thus have left millions of tons underground. The foreign advisors, one from the United States and two from Britain, are expected to help solve the problem.

Plans involving stepped-up production of existing mines, increased stripping operations, purchase of new machinery and opening of new mines were announced by government officials in an effort to boost output by 1952. The announcement was concurrent with drastic curtailments of power and gas in New South Wales, Victoria and South Australia and pointed up the need for greater production in the coal fields. Earlier, it was officially announced that dollars would be made available for the purchase of American-made plant equipment to produce gas and liquid fuels from Victorian brown coal.

The Joint Coal Board recently ordered about $10,000,000 worth of equipment in the United States and Britain to boost output in smaller mines. The goal is to step up coal production by 50 percent in four years. In spite of urging by union leaders, the government is not now going further into nationalization.

A Distributor serves you Best

RECORD MAKER CONVEYOR BELTING for heavy duty service such as rock, ore, coke, and coal. A rugged carcass with an abrasion resisting cover. Weight of duck, number of plies and thickness of covers dependent upon load and service conditions.

HOW A DISTRIBUTOR OF INDUSTRIAL SUPPLIES FUNCTIONS AS A "FAMILY DOCTOR"

A Few Brands known to Industry for over a QUARTER CENTURY

No "family doctor" prescribes medicine for his families more skillfully or sincerely than a distributor of industrial supplies selects materials and products for his industrial customers.

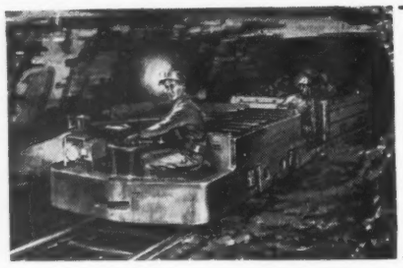
Your distributor, just like the "family doctor", has valuable personal knowledge. Your distributor knows your plant, personnel, and facilities. He knows your operating conditions, local situations, and needs. Thus, he is in a logical position TO HELP YOU SELECT the best products for specific applications.

The Republic Rubber Distributor knows the true duties, obligations, and functions of a distributor. Call him for mechanical rubber goods and other maintenance items. You'll be surprised how much valuable information he has and how he can save money for you.

MECHANICAL RUBBER GOODS BY

REPUBLIC RUBBER DIVISION

REPUBLIC RUBBER DIVISION
LEE RUBBER & TIRE CORPORATION . . . YOUNGSTOWN, OHIO
Lee DeLuxe Tires & Tubes, Conshohocken, Pa.



Equipment News

More Detailed Information and Descriptive Literature Normally Are Available on Request Directly to the Manufacturer

Glass Brattice

For better mine ventilation, Glass Fibres, Inc., Waterville, Ohio, offers the new Vitron brattice cloth and ventilating tubing made of glass fiber impregnated with plastic. The use of glass makes the material fireproof, the manufacturer points out, while the plastic coating, adjusted to provide the proper characteristics for tubing and brattice service, renders it airproof.

In addition to non-inflammability and air-tightness, Glass Fibres, Inc. also points to the fact that Vitron has a high resistance to abrasion, bending and tearing, materially increasing useful life. It will not absorb moisture and therefore will not rot or mildew, still further increasing life in service. It is very light in weight, thus reducing handling and installation labor and facilitating reclamation and re-use over and over.

Vitron brattice cloth and tubing is produced in all standard sizes and widths. In addition, it may be had in a variety of colors.

•

Rock Bits

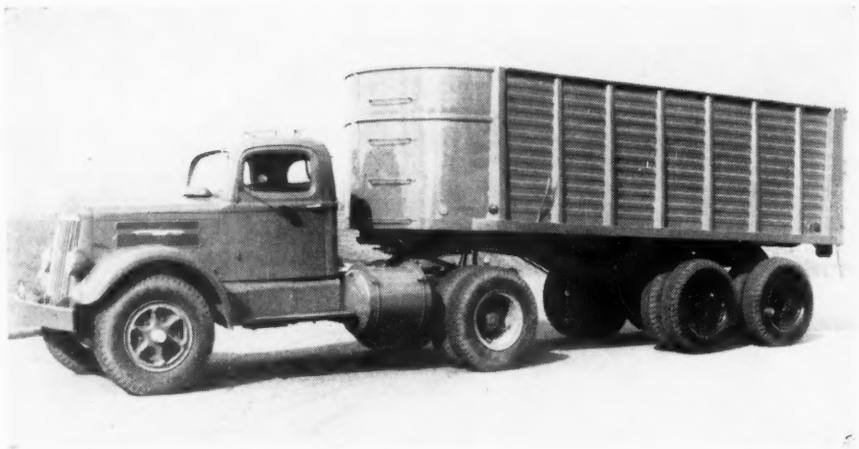
A new series of chisel-type rock bits to be screwed on standard drill rods has been made available by Kennametal, Inc., Latrobe, Pa. The new bits are offered in six sizes: 1⅜ in., 1½ in., 1⅝ in., 1¾ in., 2 in. and 2¼ in. The threads inside the body of the bit screw on steels that have H, F and D threads, thus providing a shouldered contact between the bit body and the drill rod. The blade is held in the body of the bit by an exclusive method developed by Kennametal engineers which eliminates braze strains. Water ports are provided to give positive circulation. No conversion of existing equipment is needed to use the bit, according to the manufacturer. Increased drilling speeds can be obtained from the new bits and bit life ranges up to 100 times that of steel, it is said.

•

Roller Bearings

The Rollway Bearing Co., Inc., Syracuse, N. Y., has announced "Tru-Rol," a new precision cylindrical roller bearing with steel retainer. Among the new features of the Tru-Rol bearing cited is a new one-piece steel retainer with pockets having deep broad double flanges, or guide lips, in which the rollers are kept in alignment to insure long life by the correct guiding of the rollers. The outer race is said to have deep, accurate ring grooves in the inside diameter, which fit the heavy, substantial snap rings that retain the roller retainer and rollers in the outer race which make up the roller assembly. The inner race is separate and is interchangeable.

Tru-Rol bearings are available in a range of sizes conforming with S.A.E. standards. The BE-1200 and BE-1300 series correspond to the single-row type of the 200 and 300 size, respectively. The BE-5200 series

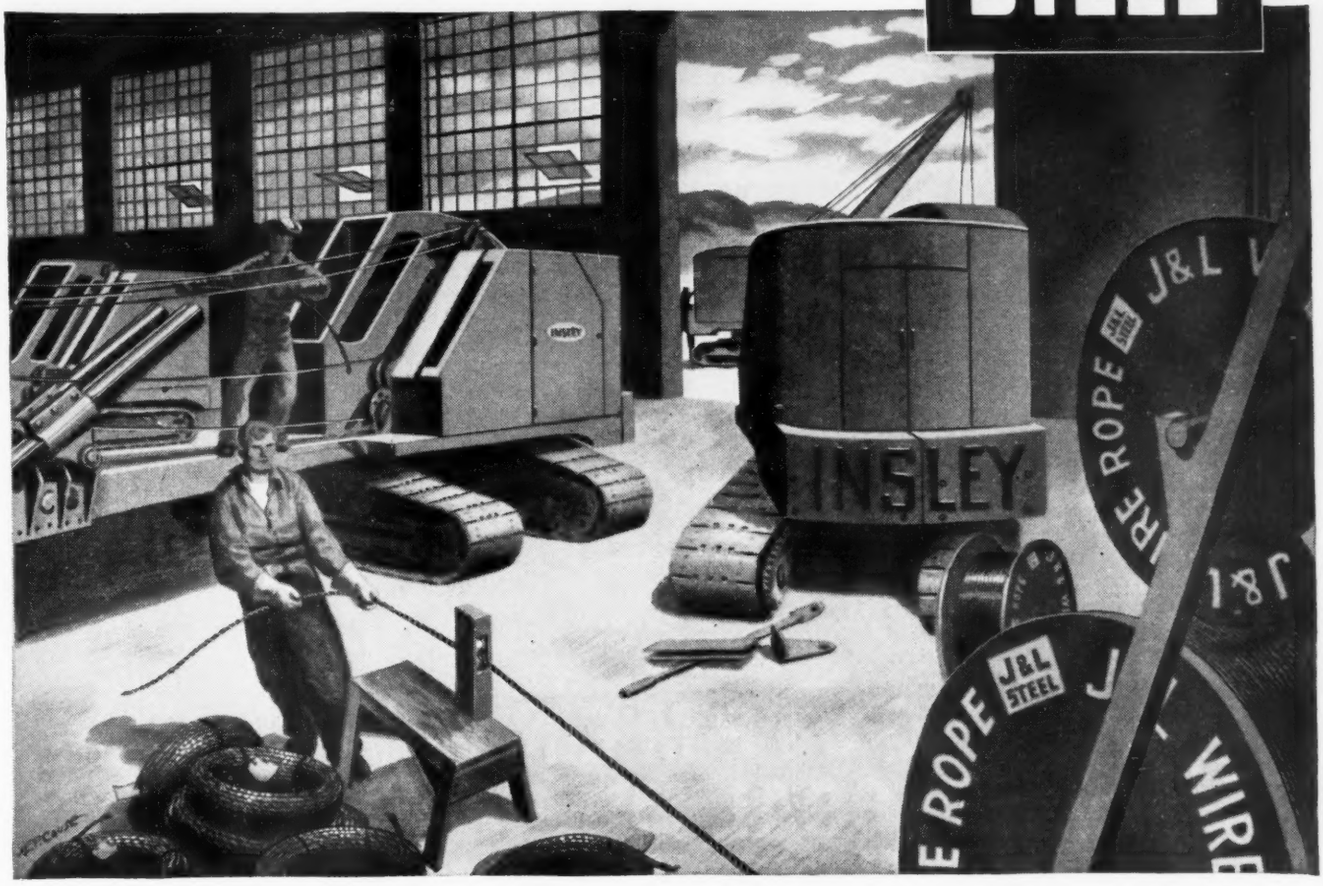


NEW TANDEM-AXLE DUMP TRAILER, announced by McCabe Powers Auto Body Co., St. Louis 15, Mo., is said to use U. S. Steel Cor-Ten, Hi-tensile steel to permit an over-all light weight for greater ease of driver handling and a larger payload capacity that is up to 50 per cent greater than usual single-axle trailers. Inside body length is 20 ft., sides and front 60 in. high.

CRANE—Model EC-7 Tournacrane announced by R. G. LeTourneau, Inc., Peoria, Ill., is said to lift weights up to 7 tons and carry the load safely on or off the road at speeds up to 28 m.p.h. One-man operated with three-way positive electric control, the unit can reverse its direction in a 20-ft. area and move away with its load in one continuous movement, the company states. Minimum head-room is 8 ft. 9 in.; maximum lift, 29½ ft.; and maximum reach behind the center line of the crane wheels, 31 ft.

INSLEY standardizes on **J&L** Wire Rope to help operators dig more profits

J&L STEEL



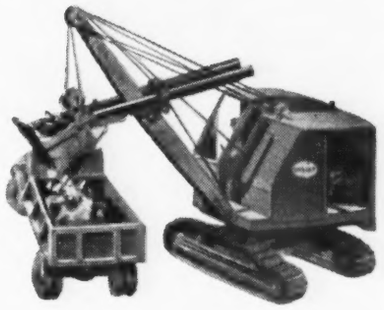
There are fewer replacements . . . less time lost with J & L *Precisionbilt* Wire Rope

Insley—the world's largest exclusive manufacturer of small excavators—has standardized on J&L Wire Rope, because more and more operators demand equipment that will *stay on the job!* Insley knows that when excavators go down for wire rope replacements, operators' profits go down too.

To build "*equipment that makes jobs pay*" Insley Manufacturing Corporation, of Indianapolis, Ind., demands stamina and quality for every part—including the best in wire rope.

J&L *Precisionbilt* Wire Ropes are built to absorb snap loads safely. They are designed to wind and rewind evenly on quick-reversing drums and travel over sheaves smoothly. Every strand on these ropes is made from a special J&L quality-controlled steel and drawn to exacting tolerances of 1/1000". Then stranded on high-precision machinery, these wire ropes have uniform diameters that even up the wear all along the working length, reduce localized abrasion and stay on the job longer.

J&L manufactures wire rope for every purpose: Excavating, material handling, marine uses, logging, mining and oil country applications. Whatever your needs, you'll find it profitable to consult with J&L engineers *first* regarding your requirements. We maintain a complete wire rope service for every field of application. Write to: Jones & Laughlin Steel Corporation, 411 Jones & Laughlin Building, Pittsburgh 30, Penna. The coupon is for your convenience.



Jones & Laughlin Steel Corporation
411 Jones & Laughlin Building
Pittsburgh 30, Pennsylvania

Please send me information about J&L Precisionbilt Wire Rope.

NAME_____

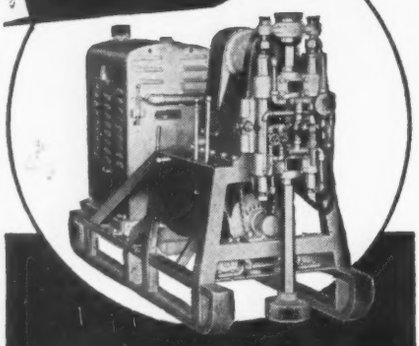
ADDRESS_____

CITY_____ ZONE_____

STATE_____

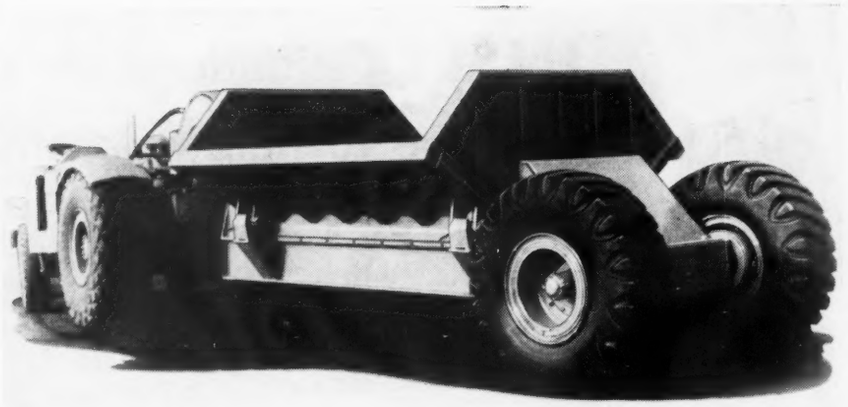
JONES & LAUGHLIN STEEL CORPORATION

Diamond Core Drilling
CONTRACTORS



Testing mineral properties with our light gasoline drills. SATISFACTORY COAL CORES GUARANTEED. Ground solidification by our pre-pressure grouting method for shafts. Wet mine areas, horizontal holes for drainage. Electric drills for inside mine drilling.

MOTT CORE DRILLING CO.
HUNTINGTON • WEST VIRGINIA



EARTHMOVER—A new PD-10 rubber tired "Quarry Trailer" has been announced by the Athey Products Corp., Chicago 38, for use with the Caterpillar DW-10 tractor. The large single low-pressure tires on the unit are said to reduce rolling resistance, permit faster hauling of heavier loads, and are interchangeable with the Caterpillar DW-10 tractor tires. Similar trailer bodies also are available with Athey's Forged-Trak Wheels, zoned equipment for all types of hauling conditions.

corresponds to the wide type. Any Tru-Rol bearing can be applied with or without the inner race, according to the manufacturer.

•

Induction Motor

A new wound-rotor Life-Line induction motor of open drip-proof construction is available from Westinghouse Electric Corp., Pittsburgh, in ratings of 1 to 15 hp. (Frames 203 through 326). The frame is rolled from steel plate and the feet are pressed steel. The pulley end bracket is pressed steel and the front end bracket is close-grained gray cast iron. Brushes for this motor—Type CWP—are electro-graphite or metal graphite depending upon service requirements. Brushholders are of the sliding box type with adjustable spring tension and are mounted on steel bolts with Micarta spacers. Self-sealed pre-lubricated ball bearings have a special lubricant sealed in at the factory, making further lubrication unnecessary for five years or more.

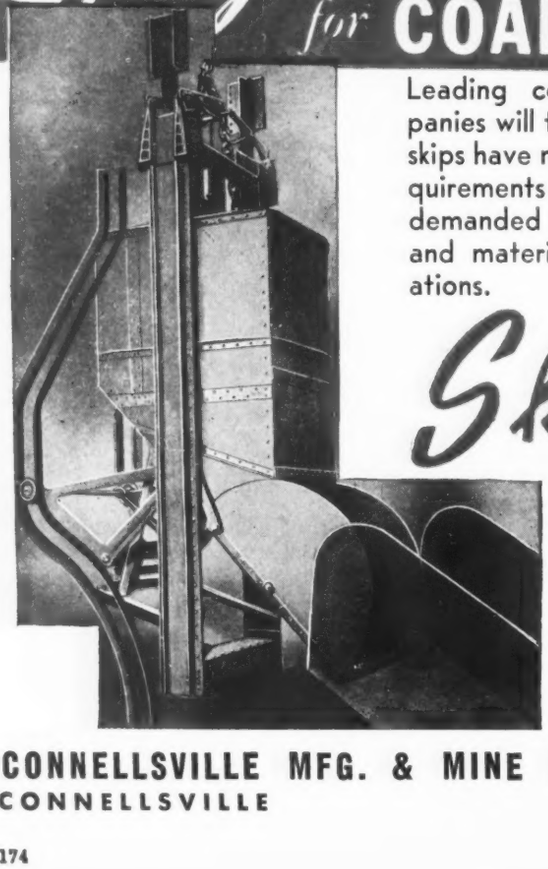
The Type CWP wound-rotor motors may be used wherever adjustable speed is required or where high-starting torque with low-starting current is necessary, according to the manufacturer. They are especially useful for driving compressors, plunger pumps, positive-pressure blowers and for bringing heavy loads up to speed. The motors are available for 60, 50 and 25 cycle, two and three phase, 208, 220, 440 and 550 volts; 1,750, 1,160, 870, 690 and 580 r.p.m. for 60 cycle; 1,450, 965, 715, 580 and 485 for 50 cycle; and 1,450, 750 and 485 for 25 cycle. Further information may be obtained from the manufacturer.

•

Fire and Water Hose

Hewitt Rubber Division, Hewitt-Robins Inc., Buffalo, N. Y. has announced that production of its top-brand Maltese Cross fire and chemical hose and Maltese Cross water hose has been resumed after being withheld from manufacture during the war because of government restrictions on the use of premium-quality materials. Features of the Maltese Cross fire and chemical hose, according to the

Lepley EQUIPMENT for COAL MINES



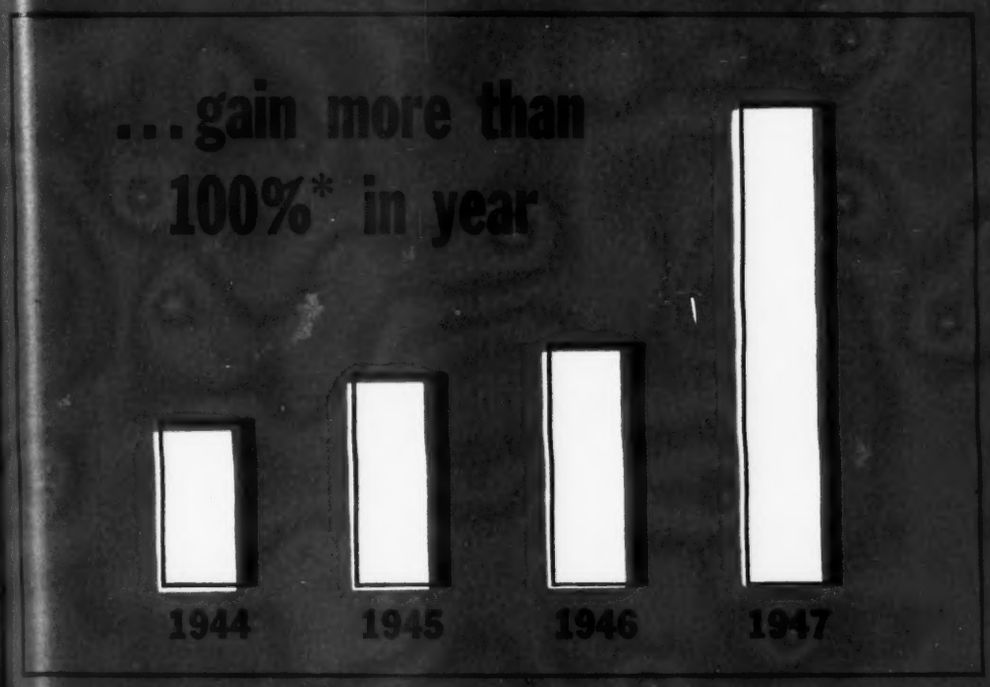
Leading coal mining companies will testify that Lepley skips have met the rugged requirements at a minimum cost demanded in modern coal and material handling operations.

Skips

For nearly 50 years we have designed skip loading equipment, rotary dumps, safety cages, sheaves, hoists and other allied units of mine machinery.

CONNELLSVILLE MFG. & MINE SUPPLY COMPANY
CONNELLSVILLE PENNA.

SALES OF "MONOBEL" AA CONTINUE UPWARD TREND



*Sales of Du Pont "Monobel" AA increased 102.5% in 1947 over 1946.

It's the permissible that helps get out more coal faster

Today, sales of Du Pont "Monobel" AA are still climbing. They offer still more proof of the increasing popularity of this relatively new coal-getter.

"Monobel" AA is steadily becoming better known for its ability to produce large lump coal by the carload. Miners appreciate its slow-heaving action that puts the coal in the right place . . . where mechanical loaders can handle it easily and quickly . . . increasing both loading efficiency and high percentage recovery.

In addition, "Monobel" AA has excellent water-resistant qualities and performs effectively even where conditions are extremely wet. It is ideal for high, hard-shooting seams and ordinary rock or slate work. In both top and bottom cuttings, "Monobel" AA shears ribs and face clean and square. Class A fumes cut down time away from the working place.

Look into "Monobel" AA. Try it. Many miners find that it reduces the number of permissibles required. Many agree, it's the permissible that helps them get out more coal faster. Ask any Du Pont Explosives representative for complete information.

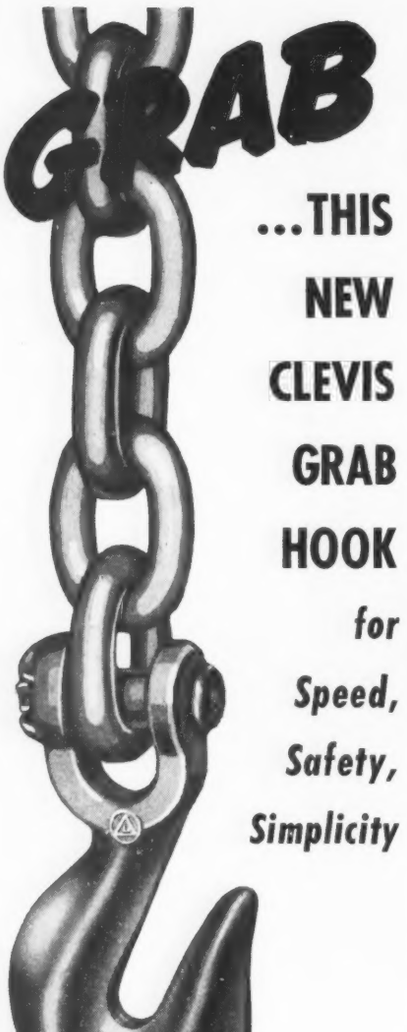
E. I. du PONT de NEMOURS & CO. (INC.)
Explosives Department **Wilmington 98, Delaware**

DU PONT PERMISSIBLES

Blasting Supplies and Accessories

DU PONT
REG. U. S. PAT. OFF.

BETTER THINGS FOR BETTER LIVING . . . *THROUGH CHEMISTRY*



GRAB ...THIS NEW CLEVIS GRAB HOOK *for Speed, Safety, Simplicity*

Here's a new one—a rugged, heat-treated, forged hook with a jaw that's quickly attached to any chain.

Slip the pin through the clevis; Spread the cotter

. . . and you've made a better, stronger connection in nothing flat. Supersafe, too—forged housing protects workers from projecting cotter pin.

Laughlin Clevis Grab Hooks do away with shackling . . . cold-shutting . . . cutting, bending and rewelding the chain. Easily changed from job to job.

Send for information . . . and Laughlin's data book of industrial fittings — Catalog #140. THE THOMAS LAUGHLIN COMPANY, DEPT. 5, PORTLAND 6, MAINE.

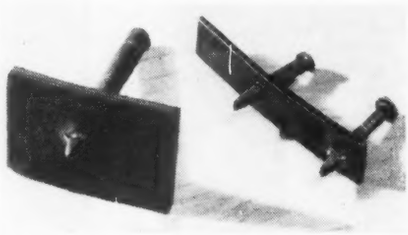
LAUGHLIN

THE MOST COMPLETE LINE OF DROP-FORGED WIRE ROPE AND CHAIN FITTINGS

company, include use of long-staple thin-gage high-tensile duck, making the hose very light in weight and easily coiled; special chemical treatment protecting the duck against deterioration by mildew, with the rubber cover eliminating the necessity of drying after use; high-quality rubber tube and cover compounded to withstand oil for long periods without cracking; and a rubber cover protecting the duck carcass from acid fumes and oil.

Maltese Cross water hose, offered in a heavy brown cover and supplied in lengths up to 500 ft., is said to be especially constructed to withstand high pressures and designed for use where long-lasting construction is essential.

•



Hardening Compound

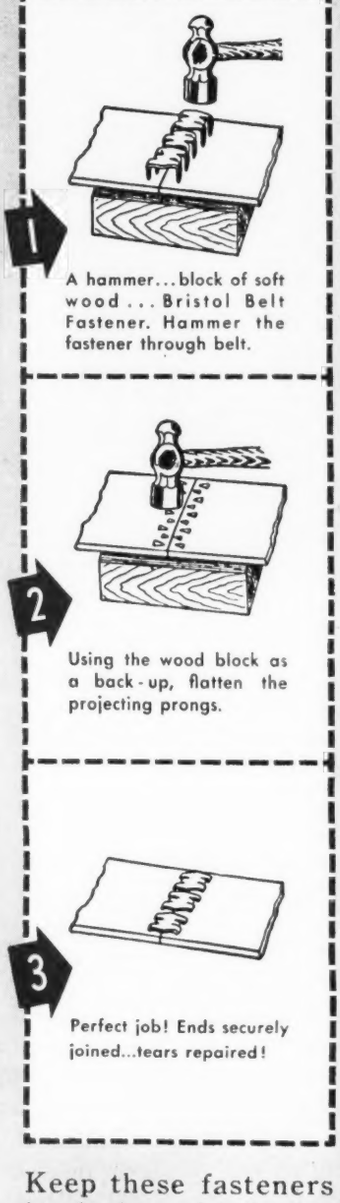
Deep penetration of cutting tools, dies, taps and reamers is possible with a new steel-hardening compound called "Hi-Speed-It," which contains no cyanide and is non-poisonous. Ordinary wire nails and common reinforcing rods can be hardened to such a degree that they can be driven through cold steel plate, as shown in the accompanying photograph, according to the manufacturer, Necamp Metallurgical Laboratories, 1 Mercer St., New York 13, N. Y. Low-carbon steel can be made into a chisel, hardened and then used to spring steel or stainless steel. Because of these unusual qualities, the powder may be useful for hardening picks, shovels and other rock-cutting tools and bits. No special equipment is needed to apply the powder and a novice can learn the technique in a few minutes.

•

Bulldozer

A newly designed bulldozer said to combine proved methods of hydraulic operation with improved construction features has been introduced by the Wm. Bros. Boiler & Mfg. Co., Minneapolis, Minn. The Bros. "Power-Plus" line of dozers, both straight and angle, now available for D4 and D6 Caterpillar tractors, incorporates the "fluid power control" provided by the LaPlant-Choate hydraulic pump. The hydraulic system of the new line combines pump, valve, and oil reservoir into a single unit. The D4 models are said to be the only track-mounted, direct-lift, double-acting hydraulic bulldozers with full-floating

The Simplest Method Of Joining And Repairing Belts


1
A hammer...block of soft wood ... Bristol Belt Fastener. Hammer the fastener through belt.
2
Using the wood block as a back-up, flatten the projecting prongs.
3
Perfect job! Ends securely joined...tears repaired!

Keep these fasteners handy for quick, lasting repairs.

Order from your distributor

THE BRISTOL COMPANY
Mill Supply Division
139 Bristol Road, Waterbury 91, Conn.

You Get "Plus Performance" with EUCLIDS

(Above) Model TD Rear-Dump Euclid. 22 ton capacity... 14.8 cu. yds. struck measure... loaded top speed 31.2 m.p.h.... powered by 225 or 275 h.p. diesel engine.

(Below) Double-acting twin hoists and entire hydraulic system are of Euclid design and manufacture. Action is fast and positive enabling operator to control body position at all times.

REAR-DUMP EUCLIDS are engineered and built for lasting strength. Their ability to stay on the job, day after day, means more tons moved at lower cost... "plus" performance for owners.

Model TD Euclid body has extra thick plates reinforced with heavy box section side and bottom supports. The rugged frame is built to stand the jolts of hauling 22-ton loads. That's why it can take the pounding and wear of loading ore, coal, overburden, and heavy excavation by large shovels and draglines.

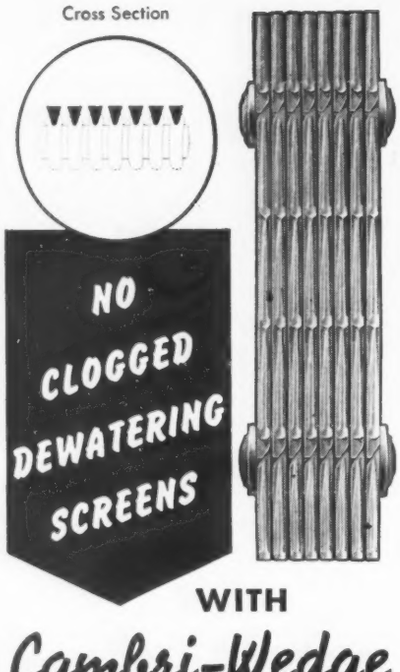
Some other "plus" features that make the Model TD Euclid unequalled for long-life and continuous performance are large capacity... ample power and traction for steep grades and tough roads... good speed on the haul road and full-floating, double reduction planetary type Euclid axle.

If you want economical operation and equipment best suited to your hauling needs, see your Euclid distributor or representative.

The EUCLID ROAD MACHINERY Co. Cleveland 17, Ohio

EUCLIDS *Move the Earth*

Cross Section



NO CLOGGED DEWATERING SCREENS

WITH

Cambri-Wedge

WEDGE WIRE SCREENS

Made under the famous British Wedge Wire Co. patent—Cambri-Wedge Riffle Surface wire screens for dewatering operations in washeries reduce the danger of clogged screen openings. Unique wedge-shaped screen members combine maximum water removal with absolute rigidity of the screen itself. Cambri-Wedge offers longer life, too—up to 4 times as long as other type screens as shown by actual use.

Cambri-Wedge wire screens are available in a wide range of metals, including stainless steel—with mesh openings from .005″ up—in any length or width of flat or Riffle Surface.

FREE FOLDER—

See how wedge wire screens can save you money, produce cleaner coal, speed your washery production. Write direct today, or call Cambridge Sales Office nearest you, for this free folder describing Cambri-Wedge Wire Screens.

Cambridge

WIRE CLOTH CO.

Department M • Cambridge 8, Md.

SALES OFFICES IN: BOSTON • NEW YORK
BALTIMORE • PITTSBURGH • DETROIT
CHICAGO • SAN FRANCISCO • ST. LOUIS

EARTHMOVING UNITS—Four new, improved cable-controlled S-type four-wheel scrapers announced by Bucyrus-Erie Co., South Milwaukee, Wis., and their struck capacities are: the S-46, 4 cu. yd.; S-68, 6 cu. yd.; S-91, 8 cu. yd.; S-113, 10 cu. yd. Increased maneuverability is one of the principal features stressed by the manufacturers. Other improvements include: a hinged apron with adjustable opening for clean discharge of sticky materials; tilting bowl with curved section and high back for better loading; positive bowl return that brings bowl back to loading position on any slope. A complete line of cable-controlled tractor equipment, including bullgrader, bulldozer, scraper and ripper, especially engineered and balanced for use with the new International Harvester TD-24 tractor, also has been announced.

trunnion rams. It is the first D4 with positive down pressure. The D6 dozer is frame mounted and, for the first time, incorporates the new compact pump with a minimum of hydraulic piping.

According to the manufacturer, a rigid frame with floating moldboard incorporates these advantages in the Power-Plus line: great strength, offset pivot pin for clearance, easy removal of main frame and blade, reversible cutting edge, correct and proved blade curvature. The moldboard fan-tail design is offset from the push frame and made wider for easier maneuvering and less wear, which is said to give a cleaner bite with less horsepower. The new straddle-mounted cylinder-bracket assembly centers lifting power and equally distributes all working forces. Side twisting is reduced. As a result, direct more positive control of blade and greater digging force results, according to the company. The full-floating hydraulic-cylinder assembly permits free movement in all directions, which tends to eliminate rod bending, piston cramping or scoring and undue wear on piston rings and wall.

•

Backing Plate

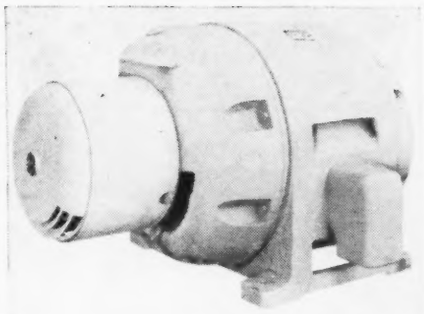
The Pyramid Industrial Screen Co., 1121 East 37th St., Brooklyn, N. Y., has announced a new Pyramid hole-backing plate for use with filter screens of all types, such as fine woven wires, perforated plate, silk cloth, filter media, etc. A maximum of open area for filtration back of the screen is supplied, the manufacturer states, as distinct from the loss of open area with normal backing plates, such as round-hole perforated. Filtration begins at the base of the pyramid-like depressions, instead of inside the perforations of a standard backing plate. In some cases, double the open area is available for filtration, with consequent doubled capacity, it is said. The tapering of the Pyramid openings reportedly greatly decreases blinding from sticky materials. The plates are recommended by the manufacturer for centrifugals, filter presses, vacuum and pressure filters, suction and gravity filters, cylinder molds and all filtering and drying installations using a combination of backing plate and filter media.

•

Dust Collector

Pulverizing Machinery Co., 228 Chatham Rd., Summit, N. J., has announced the addition to its line of pulverizing machinery for the process industries a completely new dust collector to be known as the "Mikro-Collector." Embodying new principles, according to the manufacturer, the Mikro-Collector achieves the first commercially successful application of hard-pressed wool felt as a filter medium in industrial air and gas filtration.

Actual operation, it is said, has indicated the following filter rates; minimum, 8 cu.ft. per square foot of filter surface per minute; average, 20 cu.ft.; maximum, over 30 cu.ft. Larger bags or multiple-bag units are available. The unit also is reported to efficiently handle dusts containing a high percentage of moisture or oil. Either positive or negative pressure may be used to induce the air-flow.



Motors and Generators

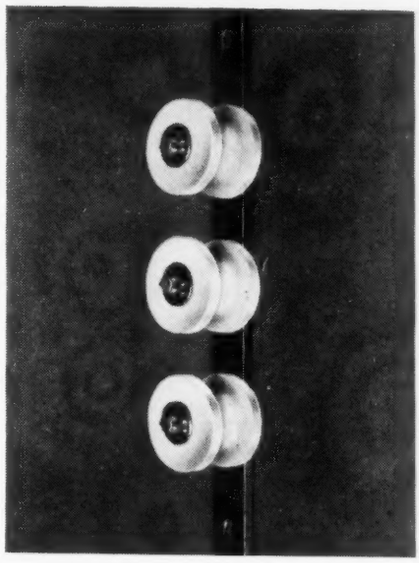
A new line of general-purpose, Tri-Clad, high-speed synchronous motors and generators in the "900" series frame sizes has been announced by the Large Motors and Generators Divisions, General Electric Co., Schenectady 5, N. Y. The new motors are available in standard ratings from 20 hp. to 1,000 hp. at 60-cycle speeds of 514 to 1,800 r.p.m., in either two-phase or three-phase types. Generators are available in ratings from 12½ to 1,250 k.v.a. The motors incorporate the usual Tri-Clad features and are drip proof. Direct-connected and belt-driven exciters are available for all ratings. Additional information about the motors is available in bulletin GEA-5113; generators, bulletin GEA-5125.

•

Cable Terminals

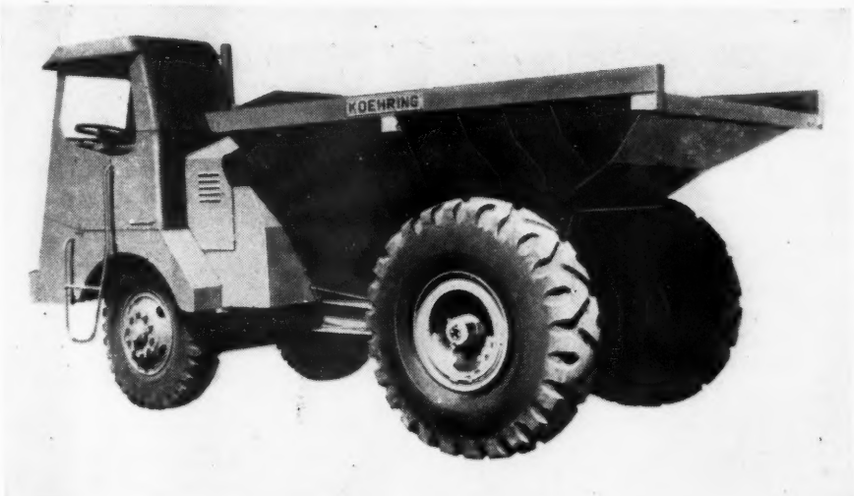
Macwhyte Co., Kenosha, Wis., is now making the "Socketype Cable Terminals," formerly made by Paulsen & Nardon, Inc., Los Angeles, as PN socket-type cable terminals. Consisting of an alloy-steel cadmium-plated eye- or fork-type fitting, plus a stainless-steel sleeve for swaging to cable, the terminals are available loose or attached to the rope in a complete cable assembly to specified length. The terminals are said to save cable and allow the cable to swivel freely when load-free, which eliminates kinking.

•



Insulated Feeder Rack

Production of a new insulated feeder rack has been announced by the Ohio Brass Co., Mansfield, Ohio. The new rack is designed to hold three 1,000,000-cir.-mil. cables vertically over one another. The insulatars are mounted on steel studs welded to a 2-in. steel channel and all steel parts are hot-dipped galvanized to resist corrosion. Clearances accommodate cables with an outside diameter of 1¾ in. Ease of stringing cables is one of the advantages of the new rack, according to the manufacturer,



A NEW HAULING UNIT, rubber-tired and designed for off-the-road hauling, with 12-cu. yd. capacity, has been announced by the Koehring Co., Milwaukee 10, Wis. The new unit, called the "Rocktor," is powered by a 6-cylinder 150-hp. diesel engine, with forward traction speeds up to 30.1 m.p.h. and two reverse speeds. Features of the "Rocktor," according to the manufacturer, are: all-welded and reinforced body, free oscillating steering axle, constant-mesh transmission and roller-mounted twin-lever Ross steering gear with Vickers hydraulic booster.

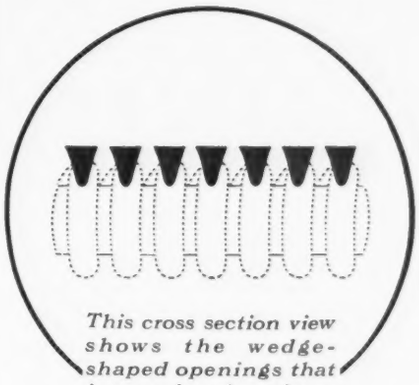
HERE'S HOW

Cambri-Wedge

WEDGE WIRE SCREENS

speed production in

DEWATERING and CLASSIFIERS



This cross section view shows the wedge-shaped openings that insure freedom from clogging, permit free drainage at all times.

FREE TO MINE OPERATORS

Mail coupon today for your free copy of this folder describing Cambri-Wedge wire screens. See how they can save processing costs and speed production in your coal preparation plant.

Cambridge
WIRE CLOTH CO.

Department M • Cambridge 8, Md.

SALES OFFICES IN: BOSTON • NEW YORK
BALTIMORE • PITTSBURGH • DETROIT
CHICAGO • SAN FRANCISCO • ST. LOUIS

Cambridge Wire Cloth Company
Dept. M
Cambridge 8, Maryland

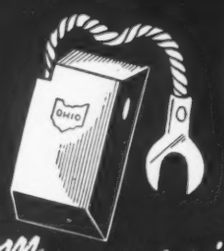
Please send me - - FREE - - the folder on Cambri-Wedge wire screens.

Company_____

Address_____

My name_____

OHIO
MOTOR BRUSHES



"from the raw material to the finished product"

Here at "OHIO" we have developed for American Industry a complete motor brush service from the standpoint of design and grade. However, from our stock we can fulfill standard industrial needs. In addition we maintain a capable engineering staff to assist you in the selection and application of motor and generator brushes, also carbon specialties.

MEET US
AT THE
SOUTHERN APPALACHIAN INDUSTRIAL EXHIBIT
BLUEFIELD W. VA.
AUGUST 19th *through* 21st

ORDER YOUR CARBON BRUSHES FROM A SINGLE SOURCE

THE OHIO CARBON CO.
12508 BEREA ROAD
CLEVELAND 11, OHIO

with the open side of the rack eliminating cable-threading through a closed eye or disassembling the rack. The weight of the cable itself usually is sufficient to hold the feeders in place but tie wires may be used if desired.

•

DRAFTING MACHINES — New features built into Bruning Standard "Equipoise" and Civil Engineers' "Equipoise" drafting machines have been announced by Charles Bruning Co., Chicago 41, including the following: accurate alignment on an inclined board, revised protractor head assembly, maximum visibility, relocated and redesigned base-line setting device and greater distance between clamp screws.

SAFETY GOGGLES—The American Optical Co., Southbridge, Mass., has announced new head-rest safety goggles which can be thrown into "off-guard" position by a flick of the wrist. Adjustment to facial contours and head size is easily made.

AIR STARTING MOTORS—Air motors of two sizes as starters for internal combustion engines now are being produced by Ingersoll-Rand Co., Phillipsburg, N. J. Sizes are 9BM and 20BM, the former having 9 hp. and the latter 20 hp. at 90 lb. pressure. The air motor may be keyed or splined to the Bendix or starting mechanism for cranking the engine.

•

Industrial Notes

Allis-Chalmers, Milwaukee, Wis., has appointed Max Bradshaw as district manager for Ohio, West Virginia and western Pennsylvania. Prior to his new assignment, Mr. Bradshaw had served in the civil engineering department of the company's Tractor Division and as materials expediter.

Marion Power Shovel Co., Marion, Ohio, has named John K. Dolan as district manager in charge of its Kansas City, Mo., office. Mr. Dolan's territory covers Kansas, Nebraska and Colorado and parts of South Dakota, Missouri and Oklahoma. He succeeds Milton S. Pohler, who has resigned to enter business for himself.

Mine Safety Appliances Co., Pittsburgh 8, Pa., has announced the appointments of George H. Deike Jr. as secretary of the company and C. P. Rooney as assistant treasurer. Mr. Deike will continue as chief engineer of the company, a position he has held since 1941. Mr. Rooney, who was named assistant secretary in 1940, will remain in that post in addition to taking over his new duties.

Link-Belt Co., Chicago 1, Ill., has

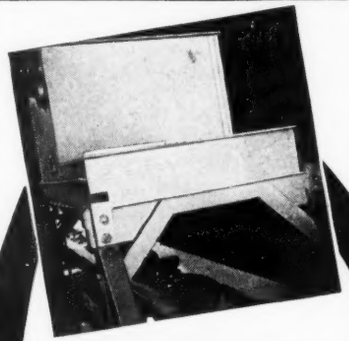
"You can't sneak down here any more since they got **BEE-ZEE** screens"

BEE-ZEE Screen Opening Stays Same Size Longer

Here's why: Bee-Zee screen bars are made of extra-tough steel that resists wear. And the bars are **round** — so that openings stay constant size until the tops of the bars are worn half through! Whatever your screening problem, it pays to use Bee-Zee screens . . .

See about it now.

BIXBY-ZIMMER
ENGINEERING CO.
961 Abingdon St., Galesburg, Illinois



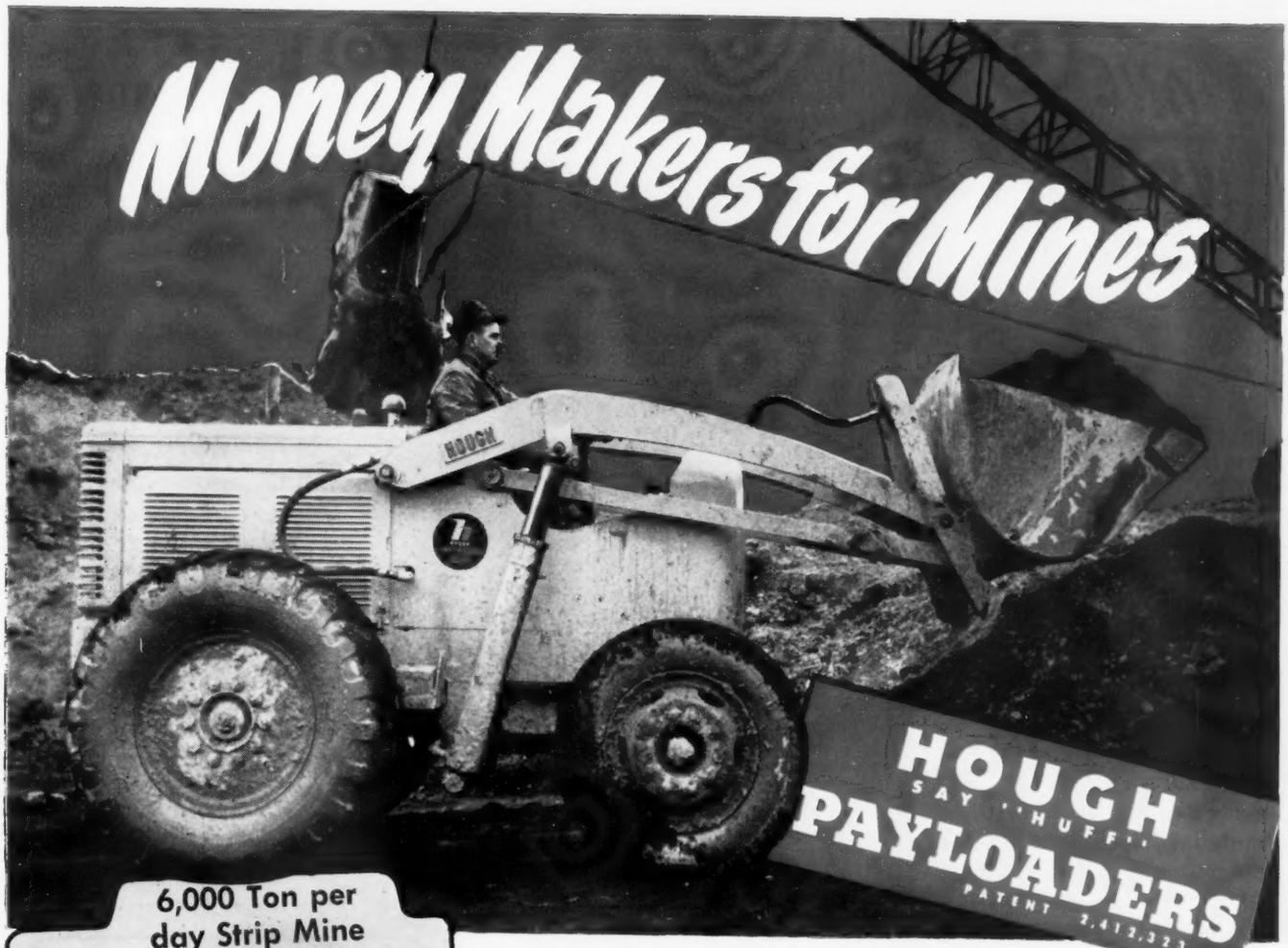
MERRICK WEIGHTOMETER

While material is smoothly moving along a conveyor, the MERRICK WEIGHTOMETER keeps a continuous and accurate record of weights. Total weight is available at a glance.

Applied to any size belt conveyor, either horizontal or inclined. The weightometer gives a simplified and dependable record of your production, without interrupting the flow of coal.

Write for Bulletin 375

MERRICK SCALE MFG. CO.
PASSAIC, N. J.



6,000 Ton per day Strip Mine

Model HL 1¼ yard diesel Payloader cleans the top of the vein after the strippers. Management credits the machine with saving 150 tons of coal per day because its pneumatic tires do not chop and grind the top of the coal like previous equipment.

600 Ton per day Strip Mine

Model HF ¾ yard Payloader cleans the top of the vein, loads trucks from stock piles near the tipple at a rate of more than a ton a minute, loads crushed rock for road repair, maintains haul roads, transports supplies and repair parts between the shop and the pit, moves and spots water pumps.

3500 Ton per day Strip Mine

Model HL 1¼ yard diesel Payloader cleans the top of the vein, maintains haul roads and drainage ditches. The Crane Hook attachment is frequently installed in place of the bucket to unload cars of structural steel and do other heavy lifting. It recently set 30 poles in 3 hours for a new power line.

Save Coal . . . Boost Output

Yes, Payloaders have "won their spurs" at coal mines because they clean the final overburden from strip pit veins without chewing and chopping the top of the coal . . . and because they can do so many other jobs around pits and tipples. They dig, grade, load, transport, lift, pull and haul.

These multi-purpose Tractor Shovels on large, low-pressure pneumatic tires have tremendous traction and flotation, are fast *to* the job and fast *on* the job . . . are completely Hough-built from the ground up. Complete hydraulic bucket control lifts, dumps, closes and lowers the bucket. Fast reverse speeds and short turning ability insure fast maneuvering and high production. Bulldozer Blade and Crane Hook attachments, quickly interchangeable with the buckets, multiply Payloader usefulness. Literature and the name of your Hough distributor are available on request.

6,500 Ton per day Strip Mine

Model HL 1¼ yard diesel Payloader cleans the top of the vein, also reclaims gravel from old haul roads and spreads it on new ones, maintains haul roads, helps reeve cables on the big shovels, tows skids of parts, tools, fuel oil, supplies and boring equipment.

700 Ton per day Strip Mine

Model HL 1¼ yard diesel Payloader cleans top of the coal vein, loads trucks with coal from stock piles in the pit, does general utility work in the pit and around the tipple.

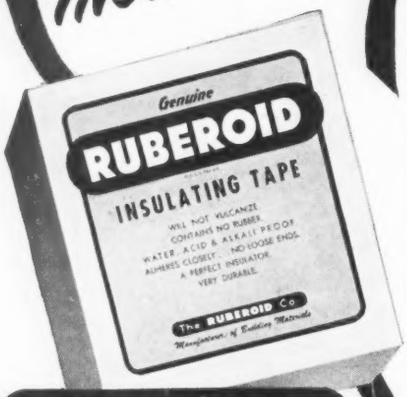
SEND TODAY for data on Payloaders, the 10½ cu. ft. Model HA; the ¾ yard Model HF; the 1¼ yard Model HL or the new 4-wheel drive 1½ yard Model HM.

THE FRANK G. HOUGH CO.

735 SUNNYSIDE AVENUE, LIBERTYVILLE, ILLINOIS

TRACTOR SHOVELS SINCE 1920

ONE WRAPPING INSULATES!



RUBEROID

INSULATING TAPE

• Because it's extra thick, just one wrapping of Ruberoid's Insulating Tape insulates valuable mining machine cables. Strong, tough, waterproof, this favorite tape does more than repair—it fortifies!

Check These Seven Features Only Ruberoid Has Them All!

1. Double grip—both sides adhesive
2. Great tensile strength
3. Won't tear, ravel or pucker
4. Resists abrasion
5. Acid and alkali proof
6. Extra thick—one layer insulates
7. Exceeds A.S.T.M. specifications . . .

—by 300% in adhesiveness
—26% in tensile strength
—290% in dielectric strength!

The RUBEROID Co.

QUALITY BUILDING MATERIALS
500 Fifth Ave., New York 18, N. Y.

appointed Crozier S. Wileman as district sales manager at Wilkes-Barre, Pa., with offices at 15-19 W. Market St. Mr. Wileman has been with the company since 1924 and with the sales department since 1931 in Chicago, Cleveland and Philadelphia. He will be assisted by Alton H. Ziegler, who recently was transferred from the Philadelphia office.

Iron & Steel Products, Inc., Chicago 33, Ill., has anounced the death of its president, Albert G. Bladholm. Before taking over the presidency of the company in 1942, Mr. Bladholm had been secretary since 1930, when the company was founded. To succeed Mr. Bladholm, the company has elected John F. Parker as president and treasurer. Other new officers are: W. J. Parker, executive vice president and secretary, and Charles A. Marshall, vice president and general manager. In addition, the company recently appointed J. J. Collins as assistant general manager. Mr. Collins formerly was with the Erie R. R., where for 37 years he had served in the purchases and stores, mechanical and reclamation departments.

The Harrington & King Perforating Co., Chicago, has appointed David K. Colesberry as general sales manager. Mr. Colesberry comes to his new position after 22 years with the Sharpless Corp., Philadelphia.

De Laval Steam Turbine Co., Trenton, N. J., has announced the retirement of H. L. Watson as president and the election of George W. Smith Jr. to succeed Mr. Watson, who will maintain his affiliation with the company as director and chairman of the executive committee.

Crocker-Wheeler Electric Mfg. Co., Ampere, N. J., Division of the Joshua Hendy Corp., has announced the appointment of Ralph S. Drummond as manager of the Cincinnati office. Mr. Drummond formerly was sales manager, Dynamotor Corp.

Thermoid Co., Trenton, N. J., has announced the appointment of A. Ray MacPherson as manager, Industrial Friction Materials Sales Division, with headquarters in Detroit, Mich. Mr. MacPherson formerly was sales manager, Standco Brake Lining Co., and for many years was associated with Raybestos-Manhattan, Inc.

Hardinge Co., Inc., York, Pa., has named William H. Shank as advertising manager to succeed R. C. Ferguson, who now is manager, North Central District. Mr. Shank formerly was associated with The W. H. Long Co., York advertising agency.

Allis-Chalmers Mfg. Co., Milwaukee, has announced organization of a sixth region for its general machinery division's field organization under William Arthur, formerly Philadelphia district office manager. The new area, designated as the Mid-Atlantic region, will embrace territory now

THE SAFE
OPEN STEEL FLOORING
IS TRI-LOK

No object over ½ square inch can pass through super-safe U-Type Tri-Lok Flooring. Fabricated without bolts, rivets or welds, it is unsurpassed for plant installation, walkways, loading platforms. Efficient distribution of concentrated loads . . . maximum free opening for light and air. Write for Bulletin JW1140.

DRAVO CORPORATION

National Distributor for the Tri-Lok Company
Dravo Bldg., Pittsburgh 22, Pa.
Sales Representatives in Principal Cities

DRAVO

FOR SAFETY'S SAKE, SUPERIOR COUPLINGS

Drop Forged Links

Drop forged for strength, Superior Swivel and Single Link Couplings are built to stand the gaff. No welds to let go with resulting wrecks. Superior Couplings on your mine cars will prevent accidents and reduce haulage costs. Order Superior Couplings for your replacements and specify them on new equipment.

DROP FORGED SWIVEL COUPLINGS

PITTSBURGH
KNIFE & FORGE CO.
1421 Reedsdale St., N.S.
Pittsburgh 12, Pa.

proper lubrication

helps prevent production set backs

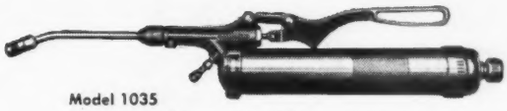
In your big job of keeping production up and maintenance costs low, production set backs caused by faulty lubrication can shoot your tonnage way down. Efficient lubrication, the Lincoln way, can minimize bearing failure and help you get uninterrupted production.

The Lincoln Model 1204 Filler Pump, with the hand guns of your selection, provides a system for fast, clean lubrication. The Filler Pump holds 30 lbs. of lubricant and fills grease guns in seconds, saving hours of your oilers' time.

Lincoln can fill your lubricating equipment needs — everything from grease fittings to complete automatic centralized lubricating systems. Your industrial distributor, or any of the offices listed below, will gladly show you how you can increase your tonnage and cut maintenance costs by applying proper lubrication methods. This service costs you nothing.

LINCOLN filler pumps and grease guns...

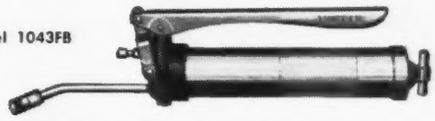
The perfect combination!



Model 1035
Lever Type Grease Gun. 19 ounce capacity

Model 1111A
Push Type
Grease Gun.
9 ounce
capacity.

Model 1043FB



Lever Type Grease Gun. 15 ounce capacity.

Model 1204
Lincoln Filler Pump
with Model 1035
Lever Gun.

SALES AND SERVICE OFFICES

BOSTON—H. G. Davis, Inc.—Kenmore 5176
BRIDGEPORT—H. G. Davis, Inc.—Bridgeport 3-8140
CHICAGO—Lincoln Engineering Co., of Ill.—Calumet 6022
CLEVELAND—Lincoln Lubricating Systems, Inc.—Express 4334
DETROIT—Lincoln Engineering Co.—Madison 3484
EAST ORANGE—Lincoln Lubricating Systems, Inc.—Orange 3-3188
LOS ANGELES—Lincoln Engineering Co., of Calif.—Richmond 0151
NEW YORK—Lincoln Lubricating Systems, Inc.—Trafalgar 7-7900
OAKLAND—Lincoln Engineering Co., of Calif.—Higate 6130
PITTSBURGH—Lincoln Engineering Co.—Montrose 1444

DISTRIBUTORS IN ALL PRINCIPAL CITIES

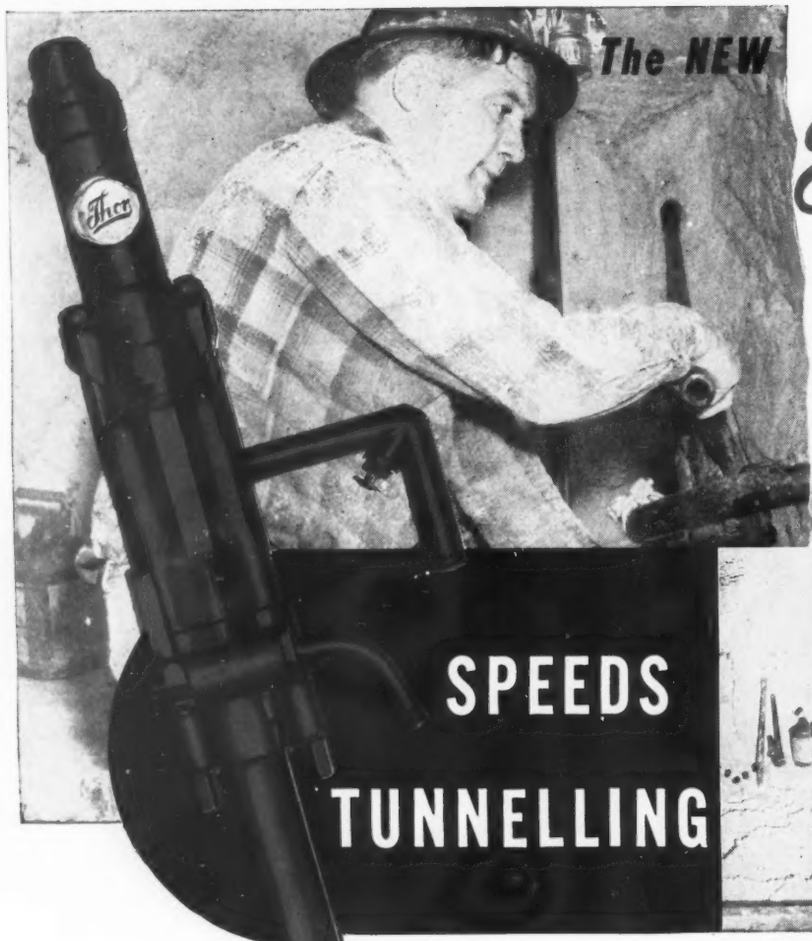
- *APPLY THE RIGHT LUBRICANT*
- *IN THE RIGHT QUANTITY*
- *AT THE RIGHT TIME*

T. M. LINCOLN REG. U. S. PAT. OFF.

LINCOLN

LINCOLN ENGINEERING COMPANY
Leaders in Lubricating Equipment for a Quarter Century
5701 NATURAL BRIDGE AVE., ST. LOUIS 20, MO.

B48-17



Thor "200" STOPER ROCK DRILL

SPEEDS TUNNELLING

LARGE TONNAGE PRODUCING MINES find Thor No. 200 Stoper "pays for itself" where over-head rock must be removed in tunnelling haulage roads for high speed movement of mechanized equipment.

Light . . .

Small . . .

POWERFUL . . .

Easy to Handle . . .

With automatic feed, *one* No. 200 Stoper gets the drilling done as fast as two crews with hand-held hammers! Many exclusive features are incorporated in the 75-pound Thor No. 200—automatic rotation . . . an exceptionally long-life chuck that permits swedging when worn . . . automatic oiling to *all* parts . closed side rod nuts . . . fully air cushioned piston . and oversize feed leg for stability. Call your Thor distributor for a demonstration.

INDEPENDENT PNEUMATIC TOOL COMPANY

Aurora, Illinois

Export Division: 330 West 42nd Street, New York 18, N. Y.

Birmingham Boston Buffalo Cincinnati Cleveland Denver Detroit Houston
Los Angeles Milwaukee New York Philadelphia Pittsburgh St. Louis St. Paul
Salt Lake City Seattle San Francisco Toronto, Canada Sao Paulo, Brazil London, England

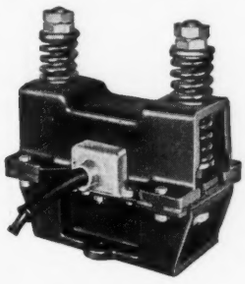
Thor PORTABLE POWER TOOLS

PNEUMATIC TOOLS • UNIVERSAL AND HIGH FREQUENCY ELECTRIC TOOLS • MINING AND CONTRACTORS TOOLS

SYNTRON

"Pulsating Magnet"

ELECTRIC VIBRATORS



Keep Bins, Hoppers

and Chutes

Open and Free-Flowing

What They Are

Pulsating electromagnets that produce 3,600 vibrations per minute from 110, 220 or 440 volt, 60 cycle A.C. There are no cans, gears, or eccentrics—merely electromagnetic reciprocation from half-wave rectified current.

Where Can They Be Applied

To any size and shape of bin, hopper and chute—whether made of steel, wood or concrete.

How They Are Applied

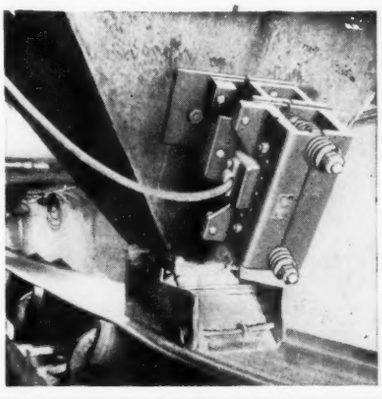
Thickness or gauge of wall is the most important factor. However, overall dimensions, cubic content, degree of fineness and moisture content of coal must also be considered.

Write,

Giving the details of your troublesome bin or hopper—our Engineering Department will be glad to give you their recommendations.

SYNTRON CO.

975 Lexington, Homer City, Pa.



covered by Philadelphia, Wilkes-Barre, Baltimore, York, Richmond and Charleston offices. Mr. Arthur is succeeded as Philadelphia district office manager, a post he has held for the past 10 years, by Frank Freyler, manager of Cincinnati district office since 1944, who in turn, is succeeded by W. F. Daly, manager of the power section of the company's steam turbine department since 1943.

Roberts & Schaefer Co., Chicago, has appointed Lee Llewellyn as a representative in the Pennsylvania, Ohio and northern West Virginia fields, with headquarters at Pittsburgh. He has had many years of experience in engineering and sales of coal preparation plants.

Hewitt-Robins, Inc., has moved its executive and sales offices from 70 Pine St. to new quarters consisting of the entire 18th floor at 370 Lexington Ave., New York 17. In addition to being executive offices, the new location will serve as eastern sales offices for the Hewitt Rubber and Restfoam Divisions, and Robins Conveyors and Engineers Divisions.

Taylor Forge & Pipe Works, Chicago, has appointed E. (Ed) L. Behrends to its general sales department. He formerly was vice president of George B. Limbert Co., and later became manager of the Western Supply Division of the Lummus Co., operating the former Limbert facilities.

LaPlante-Choate Mfg. Co., Inc., Cedar Rapids, Iowa, has named C. W. Scholvin district representative for New York, Pennsylvania, Maine, Maryland, New Hampshire, Connecticut, and the eastern part of Canada. Mr. Strolvin was formerly LeTourneau representative for the Middle Atlantic states.

Raybestos-Manhattan, Inc., Manhattan Rubber Division, Passaic, N. J., has appointed A. L. Hawk assistant to the western district manager in Chicago and R. B. Hazard manager of distributor sales, western district. Mr. Hawk formerly was manager of distributor sales, western district, while Mr. Hazard has represented the Asbestos Textile & Packing Division in the Minneapolis territory.

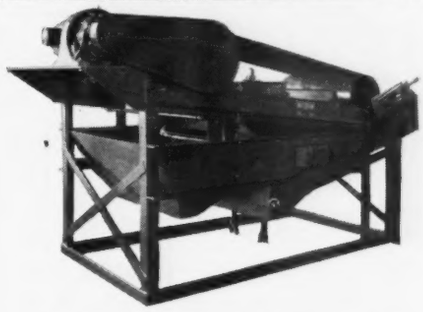
Ansul Chemical Co., Marinette, Wis., has appointed William R. Rinelli director of its new customer relations department, which will correlate the company's advertising, publicity, sales promotion and marketing. Mr. Rinelli formerly was manager of Ansul's development division.

DeLaval Steam Turbine Co., Trenton, N. J., has appointed L. D. Litsey, Litsey Equipment Co., Chicago, representative in the area for worm-gear speed reducers. Other DeLaval products will continue to be handled by the company's Chicago district office.

R. G. LeTourneau, Inc., Peoria, Ill., has appointed Danforth K. Heiple chief field engineer, succeeding R. C.

DINGS TYPE SF CROCKETT SEPARATOR

makes the Heavy-Media Concentration Process PRACTICAL



PEAK EFFICIENCY REQUIRES A *CLEAN* MEDIUM

Dings Type SF Crockett Separators, designed specifically for the purpose, keep the Heavy-Media Process at constant peak efficiency . . . assure maintenance of the proper specific gravity and purity of the ferrous medium that makes possible the most efficient and economical recovery of usable coal from your mine run.

Dings Magnetic equipment, both electromagnetic and permanent, covers a wide range of purification, separation and iron removal jobs in coal processing procedures. Ask for Catalog 550 for detailed information on Type SF Crockett Separators, and for literature on Dings complete line of magnetic equipment.

DINGS MAGNETIC DRILL EXTRACTOR

Saves redrilling to recover drill rod or bits broken off in the blast hole. Powerful Alnico Extractors lift up to 25 times their own weight. Easy to use . . . can be carried in a pocket. Write for details.

DINGS MAGNETIC SEPARATOR CO.

4720 W. McGeogh Ave., Milwaukee 14, Wis.

"Separation Headquarters Since 1899"

Dings

"HIGH INTENSITY"

"Foiled Again"

BY

SKOOKUM SLUSHER BLOCKS

If you were Micky Moisture or Mack Muck you would look frustrated too. Because SKOOKUM Slusher Blocks just can't be entered by these cheerful little spoilers.

SKOOKUM Slusher Blocks are sealed by a patented method against the ruinous effects of muck and moisture. See how it is done. Look at illustration below. Then call, wire or write for location of your nearest SKOOKUM Distributor.

Skookum's patented bearing adjustment and locking device locks out dirt, muck, moisture.

SKOOKUM COMPANY, Inc.
8504 N. CRAWFORD ST.
PORTLAND 3, OREGON

Lewis, resigned. Mr. Heiple joined LeTourneau in 1945 as field engineer after war service in the Naval aviation engineers.

National Carbide Corp., New York, has elected as president J. Carl Bode, formerly operating manager and associated with the company since 1928, succeeding L. A. Hull, named chairman of the board of directors.

B. F. Goodrich Co., Akron, Ohio, opened June 15 a new, multi-million dollar research center at Brecksville, Ohio, which according to John L. Collyer, president of the company, is to be "the most complete industrial workshop of science now in existence." The six buildings on the 261-acre site are equipped with the latest scientific tools and equipment. In addition to work on crude and synthetic rubber, the center is expected to conduct intensive research in such fields as chemicals, plastics, agriculture, horticulture and the application of nuclear energy to rubber manufacturing.

Duraloy Co., Scottdale, Pa., has appointed J. B. Dear as assistant sales manager. Mr. Dear has been with the company for many years in the factory sales office.

General Electric Co., Chemical Department, has completed a new multi-million dollar chemical plant for the manufacture of silicone materials at Waterford, N. Y. In partial operation for about a year, the new plant is now ready to produce at full capacity war-developed materials processed in the form of rubber, oils, greases, resins and water-repellents. The new plant consists of six buildings and a chemical tank farm located on a 15-acre plot.

Thew Shovel Co., Cleveland, has named Joseph F. Beles as district sales manager of the north midwest territory, with headquarters in Milwaukee, Wis. Mr. Beles, formerly associated with R. G. LeTourneau Inc. and the Heil Co., will supervise Thew-Lorain sales in Wisconsin, upper Michigan, Minnesota, North and South Dakota, Montana, Wyoming and Colorado.

●

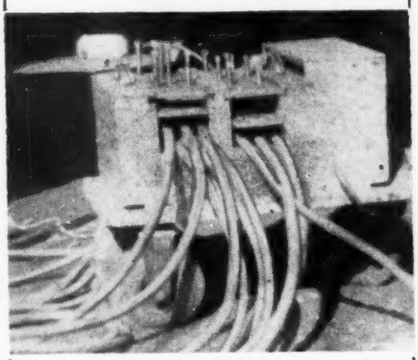
Trade Literature

Available Without Charge on Request to the Manufacturer

Electric Motors—Allis-Chalmers Mfg. Co., Milwaukee 1, Wis. Bulletin No. 05B6132A describes large induction motors of the squirrel-cage wound-rotor, bracket-bearing and pedestal-bearing types, and includes charts of electrical characteristics, representative full-load power factors, and approximate range of starting torques of squirrel-cage motors larger than 200 hp, along with a motor selection chart. Construction and features of the units also are covered.

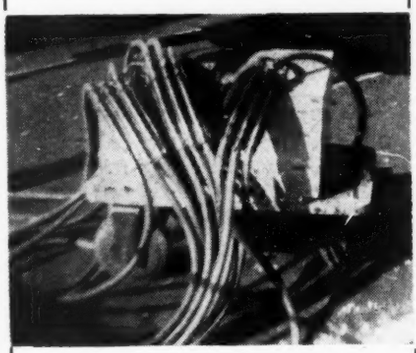
Trolley-Guard—B. F. Goodrich Co., Akron, Ohio. Folder describes con-

LOW COST CABLE SPLICING FOR COAL MINES



All types and sizes of rubber-coated mine cable spliced and vulcanized.

Insulation on conductors is cured before outer jacket is applied and cured.

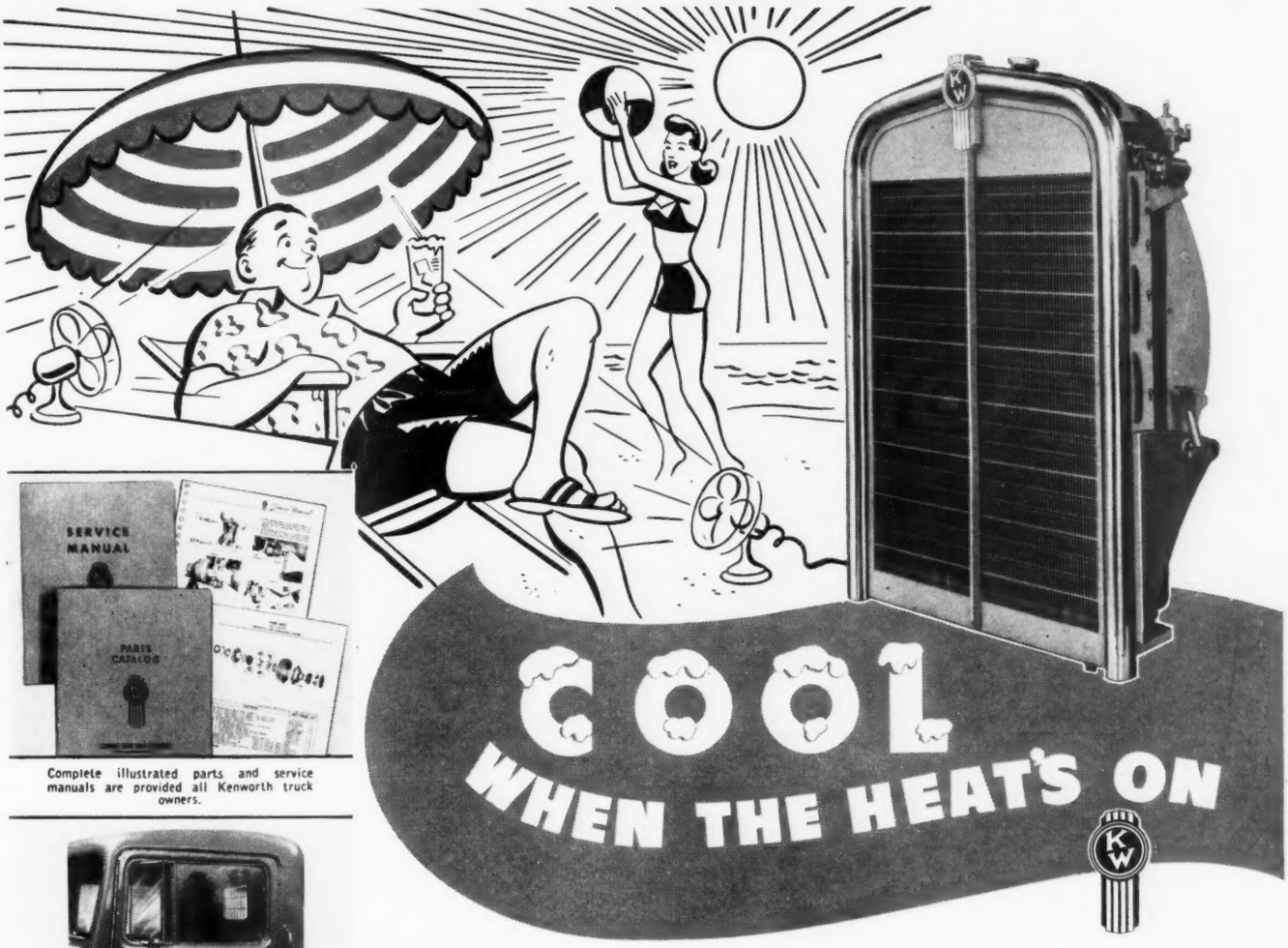


A service that helps lower your cable repair cost and assures greater safety.

Satisfaction guaranteed or you don't pay.

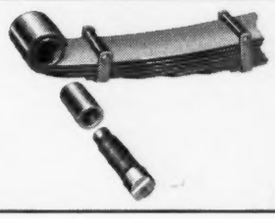
Write for quotations to:

CYRIL DAVIDSON
MINE CABLE VULCANIZING
Phone 3594-W
990 Arch St., Washington, Pa.

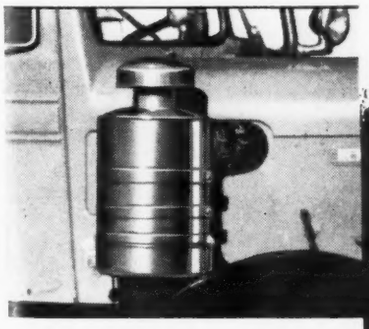


Complete illustrated parts and service manuals are provided all Kenworth truck owners.

Kenworth's continuous full length cab door hinges withstand heavy duty service.



Kenworth front spring pins and bushings are threaded and made of hardened steel.



Air cleaners on Kenworth trucks are outside mounted for greater efficiency.

When the heat's on, weather-wise or job-wise, when there are long runs to make over desert highways or up mountain grades—that's when truck operators are glad they have the advantages of the superior Kenworth cooling system. Kenworth radiators are of the tube and fin high-efficiency type. Ample depth and frontal area insure adequate cooling under even the most adverse conditions. The core and shell are pivotally mounted as a unit. Thermostatically controlled air shutters and fan shrouds are standard equipment on Kenworth trucks. Better cooling is another of the many reasons why *there's more* **WORTH** *in* **KENWORTH.**

KENWORTH

TRUCKS BUSES

FACTORY AND HOME OFFICE: SEATTLE, U. S. A.

DISTRIBUTORS IN THE UNITED STATES AND MOST FOREIGN COUNTRIES

struction of Koroseal trolley guard and outlines its advantages, which include the fact that it will not burn except when flame is constantly and directly applied and that it withstands acids, fumes, mildew and mine damp.

Electric Motors—Allis-Chalmers Mfg. Co., Milwaukee 1, Wis. Bulletin No. 51B6052J, "Handy Guide for Quick Selection of Electric Motors," provides information on a.c. general-purpose motors suitable for every industry and contains detailed specifications covering squirrel-cage induction motors and application data, range of size and speed torque curves on synchronous, wound-rotor and d.c. motors, along with applications and features of gearmotors and multi-speed induction motors and an induction-motor selection chart for units from 1 to 200 hp.

Respiratory Protection — American Optical Co., Southbridge, Mass. Chart suggests the proper respiratory protection against more than 150 specific dusts, vapors and gases, summarizing the recommendations made by the company's safety engineering division for use of its R-1000, R-2000 and R-9100 respirators, all of which have been approved by the U. S. Bureau of Mines.

Wire-Rope Slings—Union Wire Rope Corp., 21st & Manchester Ave., Kansas City 3, Mo. Bulletin describes the newest 9-part Tuffy wire-rope sling, includes application photos and charts of safe working loads for angular pulling and angles at which Tuffy slings operate most efficiently. Information on ordering and tables of standard eye sizes also are provided.

Electric Motors—Electric Machinery Mfg. Co., Minneapolis 13, Minn. Company publication E-M Synchronizer No. 24, contains articles on "Coil Insulation for Large A.C. Motors . . . new materials and methods," and "High Inertia Loads . . . their motor requirements," among others.

Protective Equipment—Chicago Eye Shield Co., 2300 Warren Blvd., Chicago 12. New safety equipment catalog lists the company's products in detail and also tells where to use, how to use, how to maintain and how to select industrial protective equipment, such as various types of goggles, welding helmets, face shields, respirators, masks, hoods and protective aprons and sleeves.

Welding—The Electric Railway Improvement Co., 2071 East 61st St., Cleveland, Ohio. Folder describes the Cadweld process, which is a means of welding copper to either steel or copper by use of powdered metals in a crucible ignited by a spark, and requiring no other source of heat.

Wire & Cable — National Electric Products Corp., Chamber of Commerce Bldg., Pittsburgh 19, Pa. Catalog No. 578 offers detailed information on the company's cables and wires available for a variety of mining uses, including 9 types of Neoprene-jacketed "Indestructo" cables for mining machines, miners' lamp cords, drill cords, portable cords and the line of "NEasbestus" fireproof wire and cables.

Silicone Products — General Electric Co., Chemical Department, Pittsfield, Mass. Bulletin No. CDR-57 describes in detail G-E silicone products, including new G-E silicone resins, oils, greases, water repellents and rubber, together with their many industrial uses. Charts and tables are included.

Gears—Pittsburgh Gear Co., 27th & Smallman Sts., Pittsburgh 22, Pa. Bulletin outlines the construction, features and performance of the new line of "Guaranteed Pittsburgh Armored Gears."

Wire Rope—Union Wire Rope Corp., 21st & Manchester Ave., Kansas City 3, Mo. Bulletin describes "Tuffy Dragline" wire rope said to be available for all dragline operating conditions and includes results of tests and on-the-job illustrations.

Tractor—Allis-Chalmers Mfg. Co., Tractor Division, Milwaukee 1, Wis. Bulletin No. MS-610 describes Model 1B wheel tractor, covering construction, specifications, features and applications of the unit.

Rock Bits—Kennametal Inc., Latrobe, Pa., Bulletin No. RB-1 covers Kennametal rock bits in 1⅜- to 2¼-in. sizes, including construction, features and prices.

Materials-Handling — Robins Conveyors Division, Hewitt-Robins Inc., 270 Passaic Ave., Passaic, N. J. Bulletin No. 125-A illustrates 12 major units manufactured by the division and as a ready reference briefly describes its entire line of materials-handling machinery.

Chemical Products—General Electric Co., Chemical Department, Pittsfield, Mass. Booklet No. CDP-576 briefly describes the wide range of products manufactured by the GE chemical department and includes products of the company's plastics division, resin and insulation materials division, metallurgy division and compound division, together with their many industrial applications.

Steel Shelving and Lockers — Precision Equipment Co., 2658 North Long Ave., Chicago 39. Catalog lists steel shelving, steel clothing lockers and other steel equipment, among the many types of steel equipment offered for immediate delivery.

Building Maintenance—Stonhard Co., 1306 Spring Garden St., Philadelphia 23, Pa. Folder outlines various products available for maintenance and repair of building floors, roofs and other surfaces.

Piston Packing—Worthington Pump & Machinery Corp., Harrison, N. J. Bulletin No. W-404-B3 illustrates construction and features of Worthington cup-type piston packing.

PROFESSIONAL SERVICES

ALLEN & GARCIA CO.
ENGINEERS AND BUILDERS OF MODERN COAL OPERATION
Authoritative Valuations, and Reports of Mining Properties Equipment and Operation.
332 S. Michigan Ave., Chicago
120 Wall Street, New York, N. Y.

MINERAL PROSPECTORS INC.
MINERAL PROSPECTING — ASSAYS — GEOLOGICAL REPORTS
DIAMOND CORE DRILLING
Middlesboro, Kentucky

F. CARL COLCORD
CONSULTING ENGINEER
COAL LAND VALUATIONS
MINE INSTALLATIONS AND OPERATION
BOX 268, PARIS, KY. Phone 327W

C. C. MORFIT & ASSOCIATES
Consulting Engineers
11 Broadway, New York 4, N. Y.
Cable Address Mandsmetal, New York

EAVENSON & AUCHMUTY
Mining Engineers
COAL OPERATION CONSULTANTS
VALUATION
2720 Koppers Bldg. Pittsburgh 19, Pa.

K. PRINS & ASSOCIATES
Engineers and Consultants
Designers of low cost coal preparation plants, Tipples and structures.
THE PRINS COAL WASHER
Wellston Ohio

HENRY O. ERB
Coal Preparation Consultant
PLANT DESIGN AND OPERATION
1018 So. 8th St. — Terre Haute, Ind.

TEMPLETON-MATTHEWS CORPORATION
Designing Engineers—Consultants—Builders
MODERN COAL PREPARATION PLANTS THRU "CO-OPERATIVE ENGINEERING"
906-06 Sycamore Bldg. Terre Haute, Indiana

J. H. FLETCHER
30 Years
Continuous Consulting Service to Coal Mines
Telephone Harrison 5151
McCormick Building Chicago, Illinois

L. E. YOUNG
Consulting Engineer
MINE MECHANIZATION
MINE MANAGEMENT
Oliver Building — Pittsburgh, Pa.

HERBERT S. LITTLEWOOD
CONSULTING ENGINEER
Application — Supervision of Installation
Maintenance - Inspection - Testing
POWER-HAULAGE-HOISTING-VENTILATION
1104 South Braddock Avenue, Pittsburgh 18., Pa.

Consult these Specialists
when you need professional assistance in solving difficult problems. Their specialized knowledge and broad experience can prove invaluable in saving both time and money for you.

to keep coal competitive...

Preparation must include

DUST PROOFING

PERMANENT ODORLESS TREATMENT

BETTER STOKER FEED

CLEAN HANDLING

LESS WINDAGE LOSS

FREEZE PROOFING

with PERMATREAT Coal Spray

The home owners of America are deciding what fuel and method of heating will get the nod in their plans for the future. Coal can compete only if it is well prepared, clean and free of dust.

Preparation engineers agree oil treating is the most acceptable method of dust-proofing. Forward looking companies are adding oil treating to their preparation plants to make their coal a better, more acceptable fuel.

One of our representatives, well trained in the coal treating field will be glad to help you select the proper equipment and installation for effective dust-proofing.

Ashland PERMATREAT COAL SPRAY seals in dust

ASHLAND OIL & REFINING COMPANY

Ashland, Kentucky

STOCK UP *NOW* on STERLING
ROCK SALT
...coal's best anti-freeze

When winter weather strikes, your dealers will order coal treated with Sterling Rock Salt to prevent freezing in transit. So order now... have your supply on hand... ready for immediate application on demand.

Free-running coal helps solve the winter fuel problem... for coal treated with Sterling Rock Salt unloads easily and quickly ...eliminates the delay and expense in thawing cars of frozen coal... speeds the return of badly needed cars to the mine.

STERLING
Auger-Action
ROCK SALT

Sterling Rock Salt helps at the colliery too. Spread on roads, scales, tracks, platforms, Sterling "Auger-Action" Rock Salt removes ice and snow that are often the cause of serious accidents and delay. Shipped in carloads of bulk or 100 lb. bags.

GET ALL THE FACTS!

Write today for our bulletin: "Pass the Salt... to keep coal from freezing."

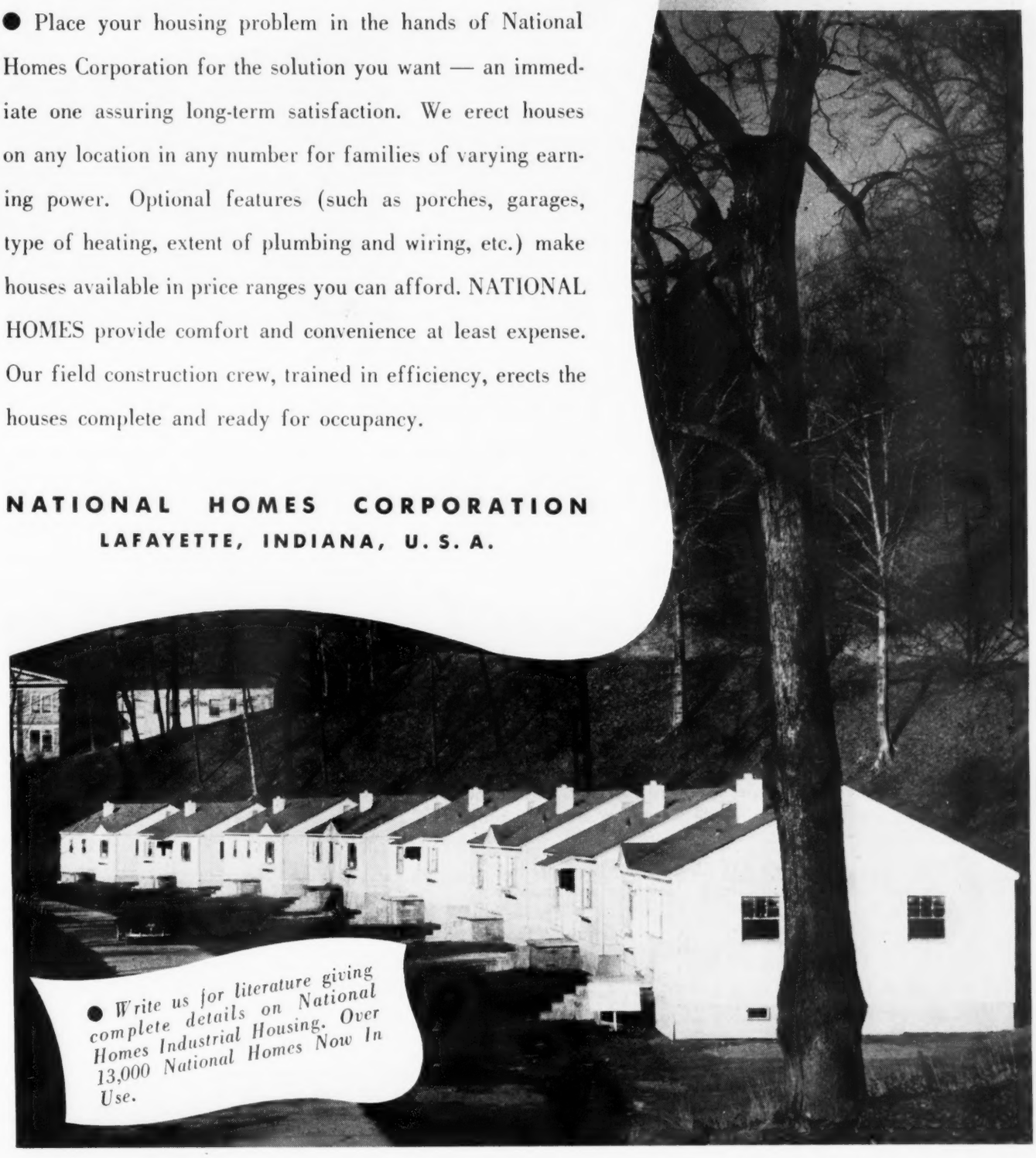
INTERNATIONAL SALT COMPANY, INC.
Scranton, Pa.

National HOMES for INDUSTRIAL HOUSING . . .

PRICE RANGE
from $3,000 up

● Place your housing problem in the hands of National Homes Corporation for the solution you want — an immediate one assuring long-term satisfaction. We erect houses on any location in any number for families of varying earning power. Optional features (such as porches, garages, type of heating, extent of plumbing and wiring, etc.) make houses available in price ranges you can afford. NATIONAL HOMES provide comfort and convenience at least expense. Our field construction crew, trained in efficiency, erects the houses complete and ready for occupancy.

NATIONAL HOMES CORPORATION
LAFAYETTE, INDIANA, U. S. A.



● *Write us for literature giving complete details on National Homes Industrial Housing. Over 13,000 National Homes Now In Use.*

Baker
TIMBERING MACHINE

Actual Service Record
At Mine 204 of Consolidation Coal Co. (Ky.) this Baker Timbering Machine, with 2 man crew sets all timbers in one section. Machine operates 3 shifts per day, placing cross-bars on 4 ft. centers

HAULS trailers loaded with timbers

Bars, posts, wedges and capboards are carried on a trailer towed behind the timbering machine. Bars or posts, as required, are slid over rollers into position for sawing and transferring to boom saddle. By utilizing a Baker Mine Tractor and extra trailers, rehandling of timbers is eliminated. Timbers are loaded on trailers in the supply yard and hauled to the Timbering Machine—the tractor returning the empty trailers.

SAWS timbers to proper length

The hydraulically-operated circular saw is placed so that even long crossbars can be cut without moving the machine. Controls are a safe distance from the saw. The initial movement of the control lever starts the saw, further movement advances it *vertically* through the timber. Weight of timber is sufficient to hold it in place without clamps.

POSITIONS crossbars against roof

Crossbars are moved across the flat deck on rollers onto the boom saddle, without lifting. Boom lifts, swings 90° to either side, retracts or advances hydraulically, controlled from operating position—permitting accurate placement of crossbar without moving the machine. Pantograph keeps bar level, and swivel joint allows it to accommodate itself to the roof. Bar is held against roof by 1000 lb. thrust while props are sawed to proper length and wedged in place.

Baker Timbering Machine has U. S. Bureau of Mines approval as permissible equipment. Write for complete information.

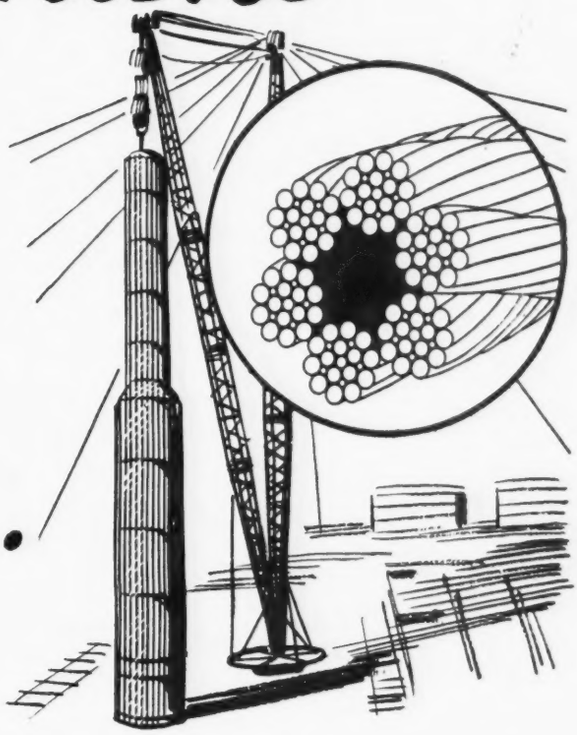
Manufactured by
THE BAKER-RAULANG CO.
2155 West 25th Street • • • Cleveland, Ohio

Exclusive Coal Mine Representatives
J. H. FLETCHER & CO.
Chicago, Illinois • • Huntington, W. Virginia

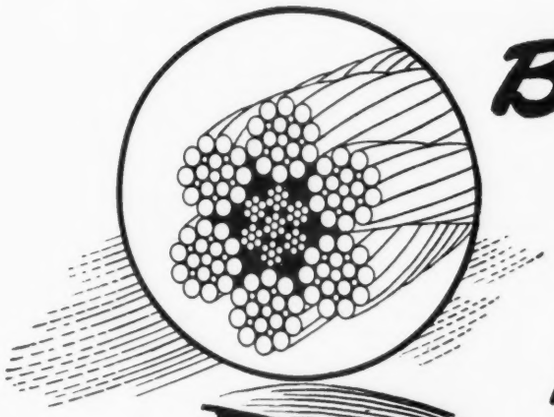
Baker MINE EQUIPMENT

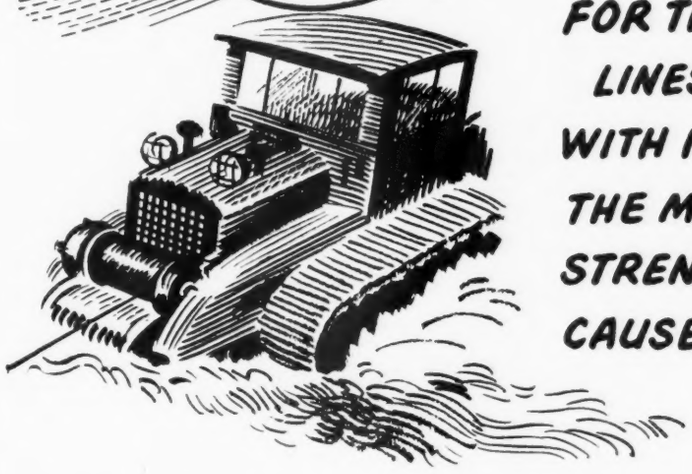
SOME ROPES FOOL YOU

U-W 6x19 FILLER WIRE CABLE WITH HEMP CENTER IS OK FOR TACKLE BLOCK FALLS BECAUSE IT IS SUFFICIENTLY FLEXIBLE AND FATIGUE RESISTANT



BUT...





FOR TRUCK AND TRACTOR WINCH LINES U-W 6x19 FILLER WIRE WITH I.W.R.C. IS BETTER BECAUSE THE METALLIC CENTER ADDS MORE STRENGTH AND RESISTS CRUSHING CAUSED BY DRUM CROSS WINDING

For longest and best service, always specify
U-W LAYRITE (*Preformed*) IMPROVED PLOW STEEL

UPSON-WALTON IS THE ONLY MANUFACTURER OF ALL 4•••
Wire Rope, Tackle Blocks, Wire Rope Fittings, Brattice Cloth.
We invite you to let us engineer your problem jobs.

Copyright 1948—The Upson-Walton Company

THE UPSON-WALTON COMPANY

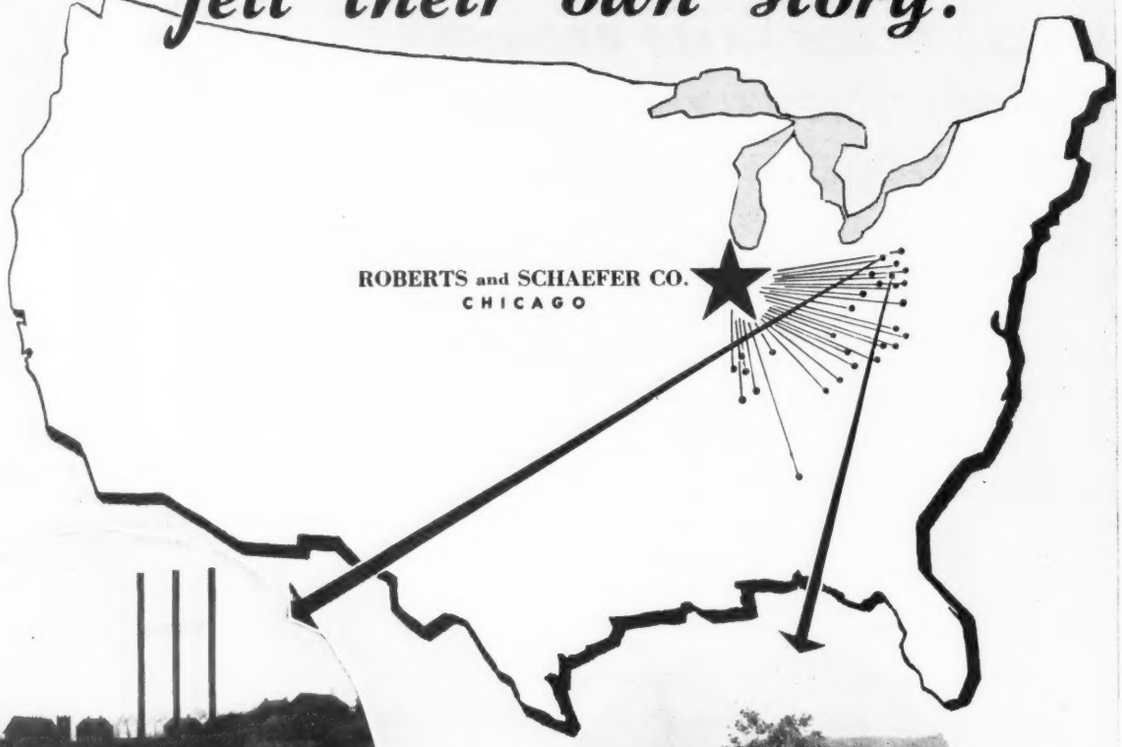
Manufacturers of Wire Rope, Wire Rope Fittings, Tackle Blocks, Brattice Cloth

Main Offices and Factory: Cleveland 13, Ohio

114 Broad Street, New York 4
3525 West Grand Ave., Chicago 51
241 Oliver Building, Pittsburgh 22

SUCCESSFUL Coal Cleaning Plants

Tell their own story!



Bethlehem Collieries Corp.
Marianna, Pennsylvania

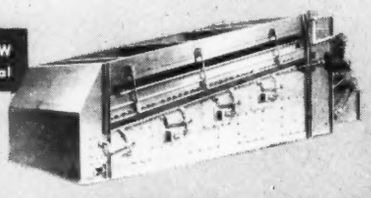
Duquesne Light Company
Warwick Mine
Greensboro, Pa.

NOTHING we can say bears more convincing testimony to the sound design and operating efficiency of Roberts and Schaefer Coal Preparation Plants than their own histories. For more than forty years Roberts and Schaefer engineers have been known as leading specialists throughout the bituminous fields.

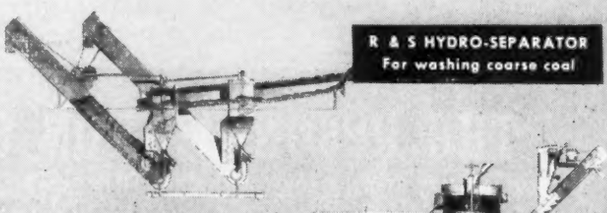
Many plants are operating satisfactorily after many years of service under pressure . . . many others are additions or new plants commissioned by previous Roberts and Schaefer clients who have discovered *how to make their coal worth more.* To make the most of your coal output it will pay you to consult Roberts and Schaefer Company.

ROBERTS and SCHAEFER COMPANY

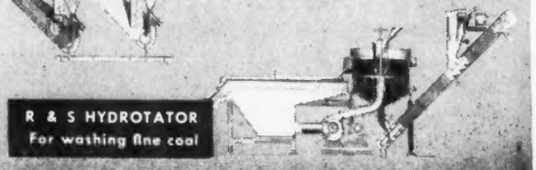
130 NORTH WELLS STREET • CHICAGO 6, ILLINOIS



R & S SUPER-AIRFLOW
For dry cleaning fine coal



R & S HYDRO-SEPARATOR
For washing coarse coal



R & S HYDROTATOR
For washing fine coal

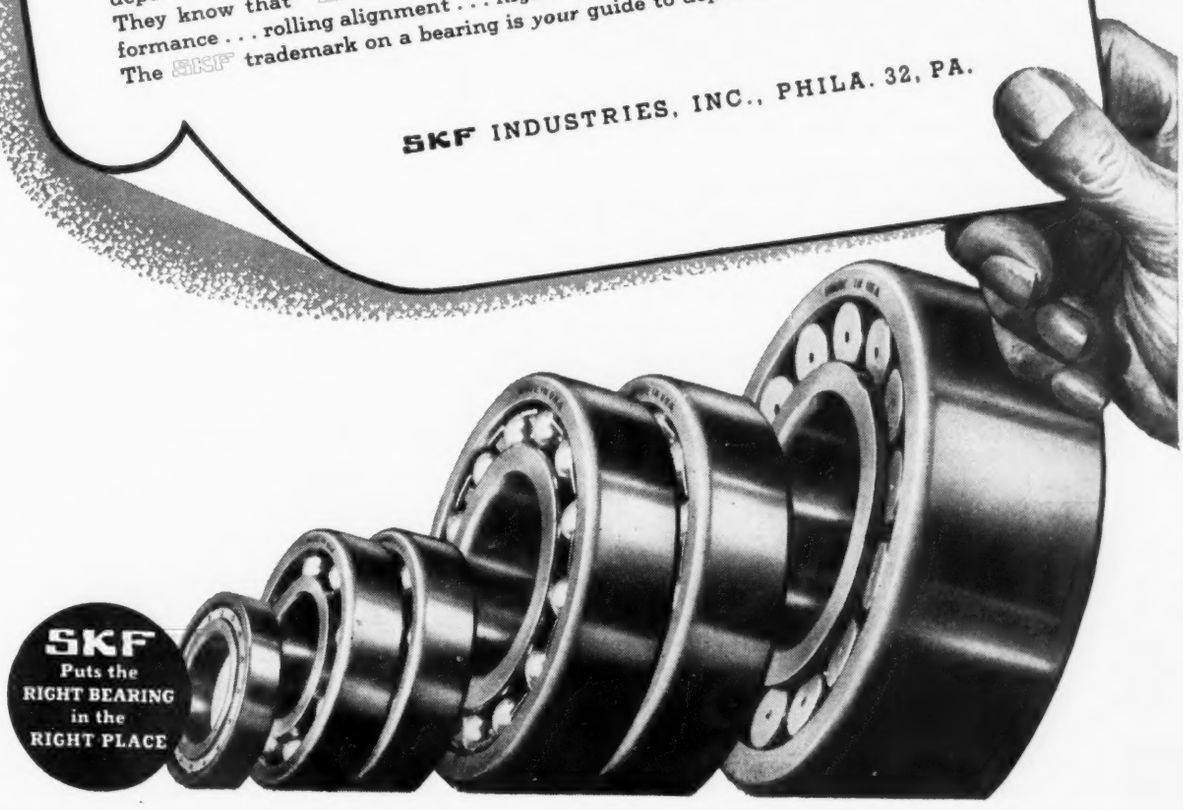
● *Built by* THE JEFFREY MFG. CO., *these two Exhaust Type Aerodyne Fans are installed in parallel, each with its own motor and drive. One fan can act as a standby unit of the other, or both fans can be operated simultaneously.*

THAT MINERS MAY BREATHE

If there's any place where bearings *must* be dependable, it's on fans that provide mines with adequate ventilation. Because SKF Spherical Roller Bearings are dependable, Jeffrey engineers for years have selected them for Aerodyne fans. They know that "SKF-equipped" is another way of saying "trouble-free performance . . . rolling alignment . . . high capacity . . . only infrequent lubrication." The SKF trademark on a bearing is *your* guide to dependable performance, too.

6431

SKF INDUSTRIES, INC., PHILA. 32, PA.

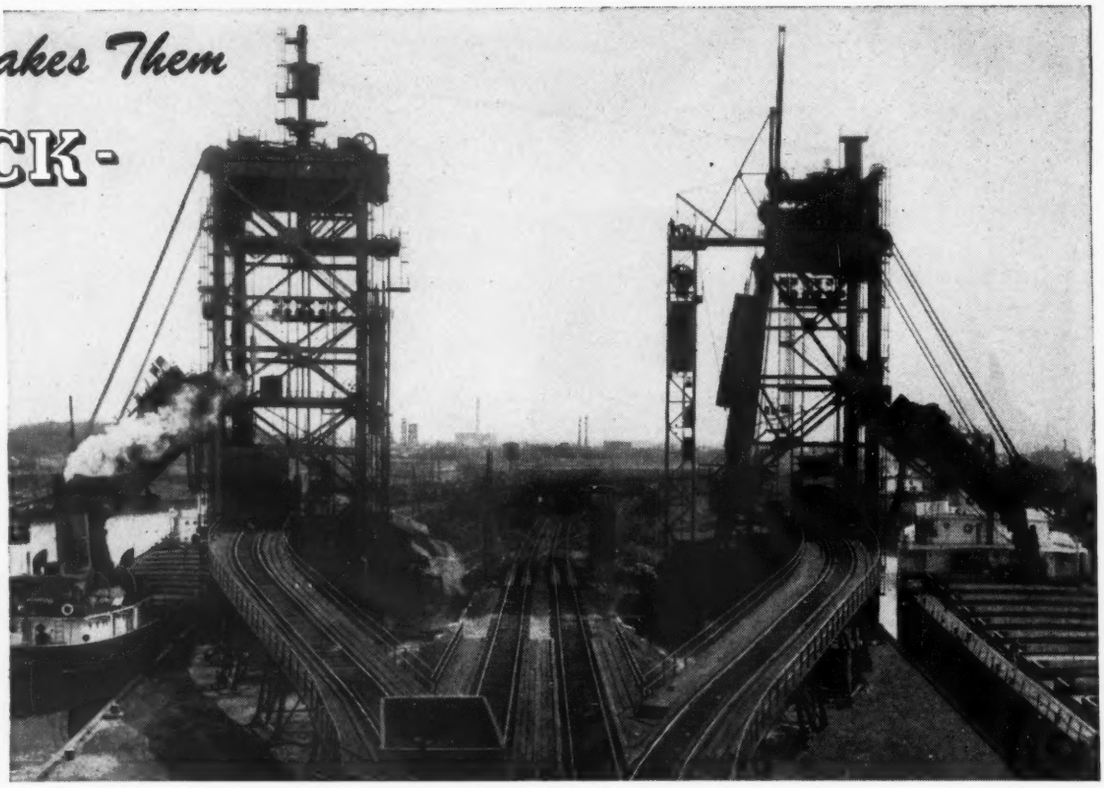


SKF
Puts the
RIGHT BEARING
in the
RIGHT PLACE

What Makes Them

TICK-

at Toledo, Ohio?



Two Heyl & Patterson Electrically-operated Car-a-Minute Coal Car Dumpers are now in action as part of the new $18,500,000 Waterfront Terminal of the Lake Front Dock and Railroad Terminal Co., at Toledo, Ohio.

You'll find a "Preference" reason for Heyl & Patterson High Lift Turnover Coal Car Dumpers when you visit the new Waterfront Terminal of the New York Central System and the Baltimore & Ohio Railroad at Toledo, O.

You will see a veteran H & P Coal Car Dumper, after 20 years of consistent service at the old Terminal, moved to the new Terminal to work alongside a brand new H & P Coal Car Dumper.

The new Coal Car Dumper is a modern version of the 20-year old Dumper. Both the old and the new dumper are the result of Heyl & Patterson's sound engineering principles and continuing efforts through 60 years to build each succeeding piece of heavy bulk materials handling equipment better than the last.

Both dumpers can be depended upon to give utmost speed to coal cargoes and to meet every demand for efficient operation and durability.

Ore Bridges
Railroad Car Dumpers } High Lift-Turnover-Rotary }
Coal Preparation Plants
Coal & Coke Handling Equipment
Boat Loaders and Unloaders
Rotary Mine Car Dumpers
Coal Crushers
Coal Storage Bridges
Car Hauls & Boat Movers
Bradford Breakers
Refuse Disposal Cars
Thorsten Coal Samplers
Kinney Car Unloaders
Pig Iron Casting Machines

Heavy Bulk Materials Handling Equipment
***All the Way from* DESIGN to ERECTION**

Heyl & Patterson, Inc.
"SINCE 1887"
55 WATER STREET · PITTSBURGH 22, PA.

Money Makes the Mine Go!

You're looking at the "business end" of a modern coal mine. At processing plants like this one, coal is washed, sized, and loaded into railroad cars—ready for millions of consumers all over America.

The processing of coal is highly mechanized at America's progressive mines. In fact, machines aid the miner in *every* mining operation, from the time coal is first cut, far underground. It is *mechanization* that has made possible America's record-breaking coal production—in response to a record-breaking demand for coal.

To keep the country's coal supply in balance with requirements, the bituminous coal industry is pushing plans for even greater mechanization—and for opening new workings, for building new processing plants, for modernizing and expanding shipping facilities.

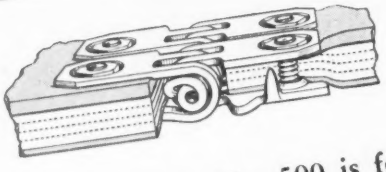
These essential improvements will cost huge sums—at least half a billion dollars in the next three years alone. Such expenditures will be warranted only if the mines are able to earn adequate profits. Indeed, most such "improvement dollars" must come directly from profits.

That is why it is so important that the industry's profit position be strengthened to build for the future . . . to assure every consumer the kind and amount of coal he requires and to prepare for the great *new* uses now in sight for coal.

BITUMINOUS COAL

BITUMINOUS COAL INSTITUTE
A Department of National Coal Association
WASHINGTON, D. C.

BITUMINOUS COAL . . . LIGHTS THE WAY . . . FUELS THE FIRES . . . POWERS THE PROGRESS OF AMERICA



Hinged Flexco No. 500 is for use on Underground Extension Conveyor Belts and any other conveyor belts measuring 3/8" to 1/2" thick.

It is *new*. It is *strong*. It has a tightly wound spiral spring for a hinge pin that is flexible — can be easily inserted — easily removed—used again and again.

It awaits your inspection at

BOOTH A-13

Southern Appalachian Industrial Exhibit

August 19-20-21
Bluefield, W. Va.

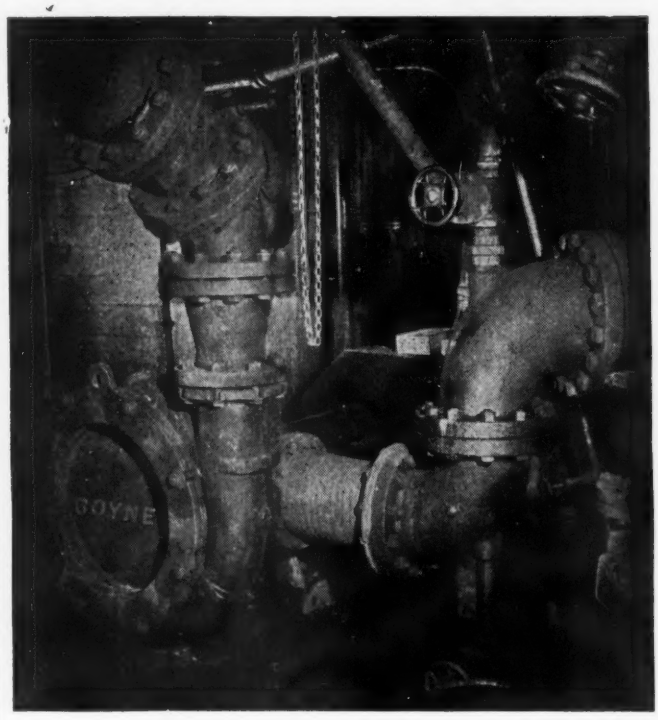
OR

Write for bulletin HF-500 and ask your Supply House for a demonstration.

FLEXIBLE STEEL LACING COMPANY

4638 W. Lexington Street, Chicago 44, Illinois

GOYNE PROCESS PUMPS



A Sand Pump is only a link in a chain in a coal washing plant, but it can be a strong link if it embodies the following features as does the Goyne.

1. Ease of inspection of all wearing parts. All internal portions are immediately accessible after removing only the rear head of the pump. No suction or discharge piping is disturbed.

2. The one packing box of the pump subjected only to suction pressure and is readily kept clean by a low pressure clear water line. Long packing and shaft sleeve life is assured.

3. Impeller clearance is adjusted *while the pump is running*, insuring constant pump capacity so essential for uniform washing.

4. There are twenty-eight possible nozzle assembly combinations for each standard pump. Washery designers like this "adaptability feature" as it helps them out of tight places and simplifies piping.

5. We carry the spare parts stock. Order your replacements when needed. Reduce your inventory by using Goyne Process Pumps.

All inquiries receive prompt and careful attention.

THE GOYNE STEAM PUMP CO.

ASHLAND, PA.

Parmanco

MECHANICAL FEED HORIZONTAL DRILL. WITH TRACTION DRIVE

Ten years of field test has proven that our power-feed design of direct transmission and worm gearing with two-speed control will not only cut shot hole drilling time in half but also eliminate costly maintenance delays. V-belt drive to the power-feed with an additional ample clutch in that assembly gives absolute control of a drilling speed of two to three feet per minute with a retrieving speed of twenty-four feet per minute.

The Parmanco Horizontal is adapted to all forms of high-wall drilling, will handle a six-inch auger up to a distance of sixty feet or more and, by use of our patented augers with interrupted flights and secondary cutters, will drill an absolutely clean hole with a minimum of torque. It permits the drilling of a controlled-angle hole which makes possible a great saving of explosives through the cantilever effect of this controlled-angle drilled hole.

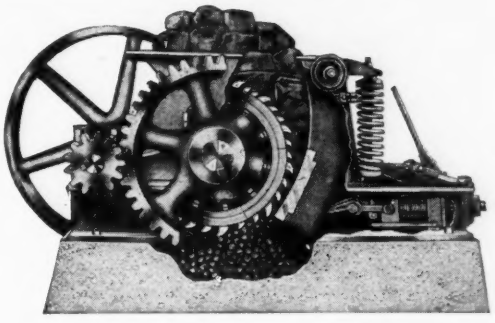
EFFICIENT STRIPPING STARTS WITH EFFICIENT DRILLING

PARIS MANUFACTURING COMPANY
PARIS, ILLINOIS

McLANAHAN BLACK DIAMOND CRUSHER

• With Automatic Steelstrut Toggle and Quick Adjustment

DEPENDABLE — **ECONOMICAL**



FAST — **POWERFUL**

Built for "peak" production under difficult working conditions—McLanahan Black Diamond Crushers are doing an outstanding performance job for hundreds of important coal producers. For present needs or future modernization of your workings—call on McLanahan. Built in all capacities for any sized product required. Descriptive data on request.

McLANAHAN AND STONE CORPORATION

Pit, Mine and Quarry Equipment Headquarters Since 1835

HOLLIDAYSBURG, PENNA.

MARLOW MINE GATHERING PUMP ON TRICYCLE

Take all you've heard about mine pump efficiency—and add *easy mobility*. That gives you a quick picture of the greatest money-saving mine pump of them all.

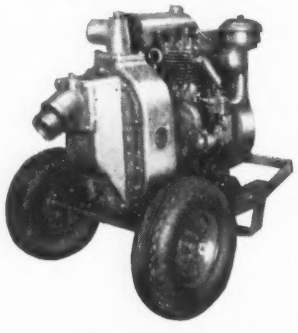
THRIFT CHAMPION

A Marlow self-priming centrifugal pumps more water per horsepower than any other mine gathering pump you can buy, and this low-built tricycle model is quickly moved and positioned in tight locations. It's completely self-priming on suction lifts to 25 feet. Exclusive diffuser priming does away with tricky by-passes and ports. There is nothing to adjust.

EFFICIENCY ASSURED

Pump parts that contact corrosive waters can be made of acid-resistant bronze. And when worn after long hard service, a Marlow pump can be quickly restored to *original efficiency* at very low cost. Both impeller and diffuser are replaceable in a Marlow. That means *continued* low-cost efficiency . . . something you can't get when only "wear plates" are renewable.

Write for Bulletin EM 46 for full details. Marlow Pumps, 548 Greenwood Avenue, Ridgewood, New Jersey.



FOR STRIP MINES

Marlow pumps with the same fully automatic action, wheel or flat base mounted, with gasoline, Diesel or electric power. Sizes 1½-to 10-inch; 50 to 4000 GPM. Request Bulletin G 46.

MARLOW PUMPS

RIDGEWOOD • NEW JERSEY

Manufacturers of Quality Pumps Since 1924

Searchlight Can Help You!

HUNDREDS of miscellaneous business problems that confront you from time to time, can be quickly and easily solved through the use of the Searchlight Section of this or other McGraw-Hill publications.

The SEARCHLIGHT SECTION Classified Advertising of McGraw-Hill Publications

Can help you by bringing business needs of "opportunities" to the attention of other men associated in executive management, sales and responsible technical, engineering and operating capacities with the industries served by:

Air Transport
American Machinist
Aviation Week
Bus Transportation
Chemical Engineering
Coal Age
Construction Methods
Electrical Construction & Maintenance
Electrical Merchandising
Electrical World
Electronics
Engineering and Mining Journal
Engineering News-Record
E. & M. J. Markets
Factory Management and Maintenance
Food Industries
Operating Engineer
Power
Product Engineering
Textile World
Welding Engineer

The Searchlight Section is the classified advertising appearing in each of these papers. You can use it at small cost, to announce all kinds of business wants of interest to other men in the fields served by these publications. It is the regular meeting place of the man with a miscellaneous business need and the men who can fill that need.

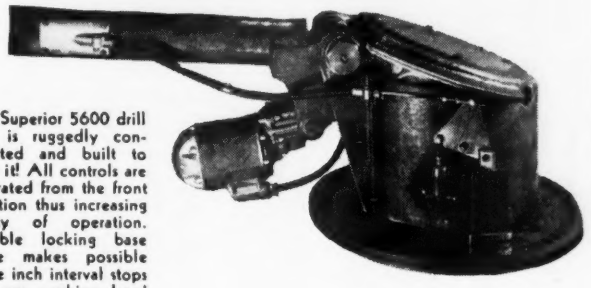
When you want additional employees, want to buy or sell used or surplus equipment, want additional products to manufacture, seek additional capital, or have other miscellaneous business wants —advertise them in the Searchlight Section for quick, profitable results!

Classified Advertising Division

McGRAW-HILL PUBLISHING CO., Inc.
330 West 42nd Street New York 18, N. Y.

new

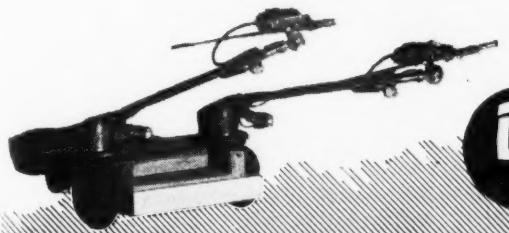
SUPERIOR
5600 DRILL ARM



The Superior 5600 drill arm is ruggedly constructed and built to take it! All controls are operated from the front position thus increasing safety of operation. Double locking base plate makes possible three inch interval stops on any working level of the arm.

- Swings quickly to any position
- Eliminates setting-up time
- Fits any mobile equipment
- Cuts drilling costs
- Saves on labor costs
- Adaptable to all mining needs
- Arms built 7′ to 9′ long

You can not afford to be without the extra production obtained by the use of a Dooley 5600 drill arm. For further information about the SUPERIOR arm call, wire or write—



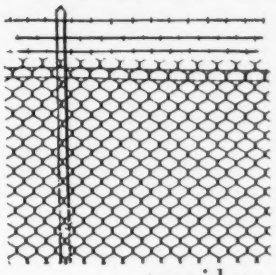
DB

DOOLEY BROS.

1201 S. Washington St., Peoria, Ill.

CF&I Quality

PRODUCTS FOR THE COAL INDUSTRY

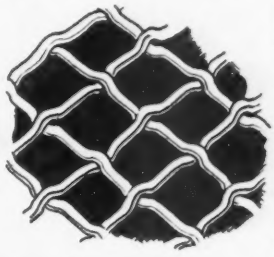


Realock Fence

. . . provides proper protection for industrial property against arson, theft, vandalism and trespassing . . . thus decreases maintenance costs and *minimizes danger of liability for personal injury.*

Calwico-Wissco Industrial Screens

. . . for sizing stoker coal.

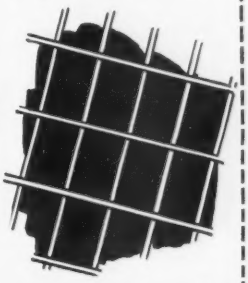


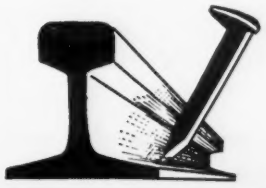
Wickwire Rope

. . . a type and size for every wire rope need.

CLINTON *Welded Wire Fabric*

. . . for safety guards around machinery.





Mine Rails and Fastenings

. . . supplied only in the Western States

The Colorado Fuel and Iron Corporation

GENERAL OFFICES: DENVER, COLORADO

IN THE EAST: THE WICKWIRE SPENCER STEEL DIVISION, NEW YORK CITY, NEW YORK

ON THE PACIFIC COAST: THE CALIFORNIA WIRE CLOTH CORPORATION, OAKLAND, CALIFORNIA

The greatest help a coal mining man can have—

IF YOU want to make sure of getting your certificate of competency—sure of winning a bigger job with bigger pay, get Beard's great books today and put them to work for you.

In these three books you have a practical, always-on-the-job guide that will help you solve the problems you face every day, show you what to do, tell you why it should be done.

Beard's

Mine Examination Questions and Answers

3 Volumes—$8.25, Payable in Three Easy Installments

THESE books explain what a man must know in order to become a mine inspector, a mine foreman, assistant foreman, fireboss, hoisting engineer, safety engineer, shot-firer, etc.

They give you complete and authoritative information about air and gases, explosives, safety requirements and methods, mechanics, engines, hoisting, drainage, pumping, ventilation, timbering, instruments, and every other detail that the practical mining man must know.

Can you answer these questions—

What is meant by splitting the air current and what are the advantages derived from such methods?

Can a miner live in air in which the oxygen content is reduced to 17 per cent?

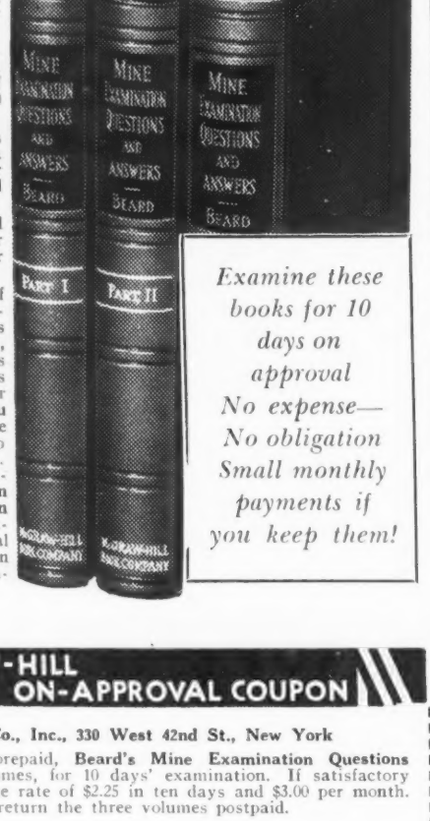
Name five duties imposed on mine foremen by law?

In what time can an engine of 40 effective hp. pump 4,000 cu. ft. of water from a shaft 360 feet deep?

What are the advantages and disadvantages of a gasoline pump, an air pump and an electrical pump?

What is the estimated tonnage per acre, per foot of thickness, for bituminous coal?

These are but a few of the more than 2,000 questions given in Beard's books together with full, correct answers. Hundreds of men have used this method to prepare for higher, better jobs. You can, too, if you have the Beard books and plan to use them systematically. They are the best investment that a mining man can make—not only as an aid for passing examinations but as practical reference volumes on everyday mining operation problems.



Examine these books for 10 days on approval
No expense—
No obligation
Small monthly payments if you keep them!

McGRAW-HILL ON-APPROVAL COUPON

McGraw-Hill Book Co., Inc., 330 West 42nd St., New York

Send me, charges prepaid, **Beard's Mine Examination Questions and Answers,** 3 volumes, for 10 days' examination. If satisfactory I will pay $8.25 at the rate of $2.25 in ten days and $3.00 per month. If not wanted I will return the three volumes postpaid.

Name .....

Address .....

City and State .....

Company .....

Position C-8-48

Sand Drying Stoves

The SUTTON No. 0 IMPROVED SAND DRYER includes all the time-tested principles that have made SUTTON STANDARD Sand Dryers a favorite for over forty years, plus many improvements to give you even better results. Write for catalogs, prices.

- PERFORATED RING — Entirely new design.
- A FIRE BOWL added between the grate and perforated ring. New type FIRE GRATE.
- ASH PIT DOOR EXTENSION to protect clean sand from ashes.
- 3/16" STEEL PERFORATED SKIRTING with clean-out doors.
- ECONOMY FLAME SPREADER in dome.

SUTTON

Made by **INDIANA FOUNDRY CO.**

950 Oak Street — Indiana, Pa.

At Your Service

—for bringing business needs or "opportunities" to the attention of men associated in executive, management, sales and responsible technical, engineering and operating capacities with the industries served by the following McGraw-Hill publications:

THE SEARCHLIGHT SECTIONS

(Classified Advertising)

Air Transport
American Machinist
Aviation Week
Business Week
Bus Transportation
Chemical Engineering
Coal Age
Construction Methods
Electrical Construction & Maintenance
Electrical Merchandising
Electrical Wholesaling
Electrical World
Electronics
Engineering and Mining Journal
Engineering News-Record
E. & M. J. Markets
Factory Management and Maintenance
Food Industries
Power
Product Engineering
Textile World
Welding Engineer

For advertising rates or other information address the

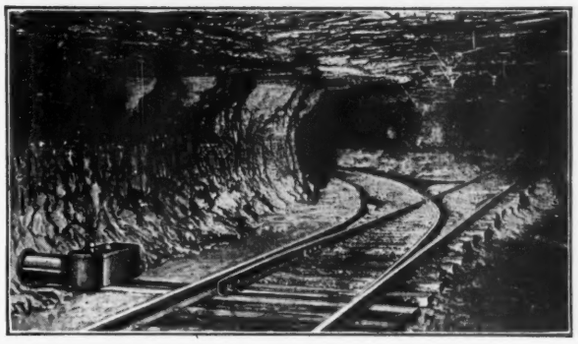
Classified Advertising Division

McGraw-Hill Publishing Co., Inc.

330 W. 42nd Street — New York 18, N. Y.

FULL SPEED AHEAD

WITH THE CANTON AUTOMATIC SWITCH THROWER



Greatest number of trips in a given time is accomplished by the "Canton" Automatic Switch Thrower. This eliminates stopping for switch to be thrown, saves labor, and eliminates that accident potential. For further safety, signal lights show position of points, if blocked or split. All flashing and sparking at points of contact with trolley wheel are eliminated. This unit is as nearly fool-proof as is possible. Constructed on the solenoid principle in combination with patented automatic cutout, actuating mechanical connection to the Track Switch, instantly throwing the switch points against the rail on either side of track. Can be used as an automatic derailer, protecting life and property . . . operated usually by the motorman while traveling full speed ahead.

Write for complete descriptive catalog, using street and zone numbers.

AMERICAN MINE DOOR CO.

2059 DUEBER AVE. CANTON 6, OHIO

. . . invaluable for gaseous mines

If tripped by overload, moving handle to "Reset" puts the Flood City Starter back in operation. De-Ion grid contacts allow great interrupting capacity. Permits maximum motor performance — assures positive protection with no fuse necessary.

Write for free bulletins

"No Fuse"

Type Permissible Starter

Flood City Brass & Electric Co.

JOHNSTOWN PA.

The Cincinnati

TRADE MARK

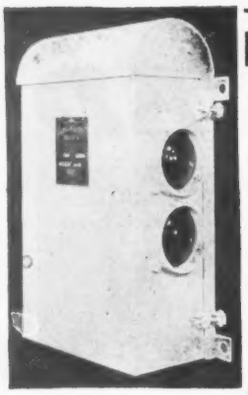
Write today for FREE illustrated bulletin

$155.00

ONE-MAN COAL DRILL

. . . lowers drilling costs because it is designed and constructed to give more power "pound for pound" and more drilling efficiency "day after day". Used successfully in drilling both anthracite and bituminous coal. Easy to operate. Sold with money-back guarantee. Write today.

THE CINCINNATI ELECTRICAL TOOL CO.
Division of The R. K. LeBlond Machine Tool Co.
2635 MADISON ROAD - CINCINNATI 8, OHIO



NUSSCO AUTOMATIC MINE SIGNALS

For Main Haulage • Prevent Collisions
Save Trip Time

A two wire cable connects two or more signals together into one block. Only one signal can show proceed on the entrance of a trip, all other signals show stop.

- Low in Cost.
- Easy to Install.
- Write for Catalog.

NACHOD & UNITED STATES SIGNAL CO.
INCORPORATED
4771 Louisville Ave., Louisville, Ky.

CESCO ELECTRICALLY OPERATED TRACK SWITCH

Thrown by Motorman
Operates Switch Safely • Saves Time and Money

This modern track switch is thrown swiftly and safely by motormen as they sit in their cabs. It saves time and money, and is fool-proof and dependable!

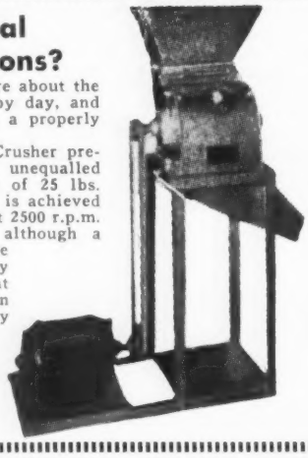
Over 40 years experience manufacturing
ELECTRIC TRACK SWITCHES

Write for Catalog
CHEATHAM ELECTRIC SWITCHING DEVICE CO.
INCORPORATED
4780 Crittenden Drive, Louisville, Ky.

Does Your Coal Meet Specifications?

There's only one way to be sure about the quality of your product, day by day, and that is by constant testing in a properly equipped laboratory.

The WISE Laboratory Coal Crusher prepares coal for testing with unequalled speed and economy. Capacity of 25 lbs. per minute through ¾" screen is achieved with ¾" hp. motor operating at 2500 r.p.m. WISE Laboratory Crushers, although a comparatively new product, are already used and endorsed by some of the most prominent coal testing organizations in the United States. Write today for complete information.



O. B. WISE CO.
Knoxville, Tenn.

At Your Service . . .

The Searchlight Section is at your service for bringing business needs or "opportunities" to the attention of men associated in executive, management, sales and responsible technical, engineering and operating capacities with the industry served by this McGraw-Hill publication.

When YOUR chance comes

to step into a better job
WILL YOU BE PREPARED?

These are times of change in the business world. New jobs are opening up, and they must be filled, and filled quickly—with men who are able. Here are books giving quick access to fundamentals and practices that promote executive efficiency to help you prepare yourself so that when your opportunity comes you will be ready.

- How to organize a single department or a whole business . . . plan and control its workings . . . provide and maintain the most happy and efficient personnel.
- How to keep the life-blood flowing in business . . . where and how to get money . . . how to utilize it . . . how to keep the business in sound financial condition.
- How to reduce credit losses . . . handle the important elements of credit policy . . . modernize your collection system . . . write better letters . . . put the company's correspondence on a more economical and effective basis.
- How to lay out a workable approach to marketing methods . . . improve the sales organization . . . develop promotion ideas . . . stimulate results in any of the several avenues of marketing.
- How to do more work yourself . . . conserve and direct your energies . . . and how to handle scores of problems, small and large, detailed aspects of these important fields of business activity.

The McGraw-Hill Library of
BUSINESS MANAGEMENT
6 volumes, 1973 pages

This is a business executive's library. The books in it cover the elements of management most needed in executive approach to business. Use it for immediate help on specific problems, large and small—use it to master the patterns underlying methods, to get the knowledge of *all* business you need quickly now.

10 Days' Free Examination

Under our offer get all six books on approval. Test their practicability for 10 days. Then, if you decide to keep them, pay in small monthly installments. Act now—send the coupon today.

McGraw-Hill Book Co., 330 W. 42nd St., N. Y. C. 18
Send me the McGraw-Hill LIBRARY OF BUSINESS MANAGEMENT, 6 volumes, for 10 days' examination on approval. In 10 days I will send $2.50, plus few cents postage, and $3.00 monthly until $17.50 is paid, or return the books postpaid.

Name .....
Address .....
City and State .....
Position .....
Company C-8-48

"MICHIGAN" WOOD STAVE MINE PIPE

For Handling Sulphuric Mine Water

Used by the largest mines in the United States, "Michigan" Wood Stave Mine Pipe has provided an economy unattainable thru the use of metal pipe.

"Michigan's" resistance to sulphurous mine water and culm--its long life, coupled with an ease of installation are factors which assure its supremacy in the mining field. A full range of standard sizes--2" to 48" will satisfy most mine needs. Write us stating your requirements.

SELECT MICHIGAN PINE OR CLEAR DOUGLAS FIR | THICK PROTECTIVE ASPHALT COATING | HEAVY STEEL BANDING | REINFORCED WATERPROOFED COVERING

MICHIGAN PIPE COMPANY
506 Phoenix Bldg., Bay City, Michigan

COMPLETE BELT CONVEYORS

BELTING • IDLERS • HEAVY DUTY PAN FEEDERS

Immediate Delivery WRITE FOR LITERATURE *Reduced Prices*

FRANK A. KREMSER AND SONS, INC.

3435-45 NORTH 5th STREET, PHILADELPHIA 40, PENNA.

At Fifth Street Where The World Goes By On The Pennsylvania Railroad • REgent 9-7272 " 9-7524

PERFORATED METAL
COAL MINING SCREENS

Manufactured exactly to your specifications.
Any size or style screen, in thickness of steel wanted with any size perforation desired.
We can promptly duplicate your present screens at lowest prices.

CHICAGO PERFORATING CO.
2443 West 24th Place
CHICAGO, ILLINOIS
Canal 1459

"We look into the Earth"

CORE DRILLING
—anywhere!

PENNSYLVANIA Drilling CO.

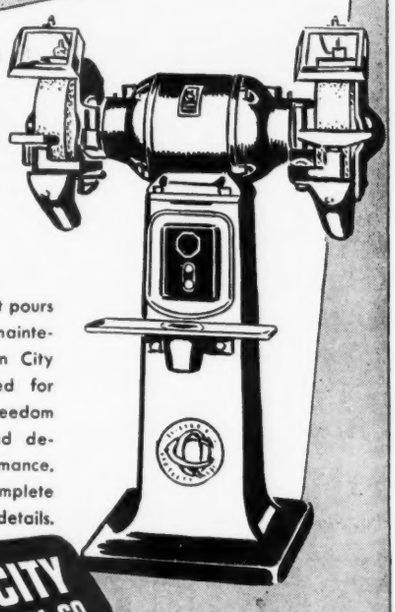
DRILLING CONTRACTORS

1205 Chartiers Ave. **PITTSBURGH, PA.** WAlnut 5816

---

cut tool costs...

with rugged **QUEEN CITY GRINDERS**



It takes a top-quality grinder to stand up under the heavy work that pours through a mine maintenance shop. Queen City Grinders are noted for their durability, freedom from downtime and dependable performance. Send for catalog complete with prices and details.

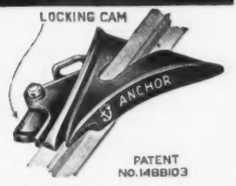
QUEEN CITY MACHINE TOOL CO.

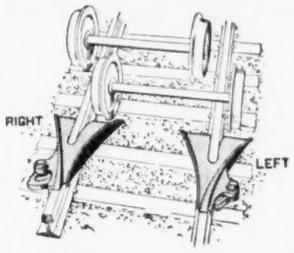
215 E. 2nd St.
Cincinnati 2, Ohio

AGENTS IN PRINCIPAL CITIES

World's Quickest Way to Rerail Cars and Locomotives

Nolan Rerailers Get 'Em Back on the Tracks, Saving Time, Labor, Money





• This is the quick, efficient way to get derailed cars and locomotives back into productive service. No other rerailer has the patented, scientifically-designed features of the Nolan Rerailer.

Smashed hands, strained backs and often fatal accidents are eliminated when Nolan Rerailers are used. Safety Inspectors and Engineers highly recommend their use. Made of special high carbon steel for durability and long life.

How Nolan Rerailers Work. Nolan Rerailers are used in pairs, and will retrack wheels from either or both sides of rail at same time. Each Rerailer straddles the rail, and the narrow end on top of the rail. The derailed wheel comes up the gradual slope, and is forced back on to the rail by the guiding grooves and ridges. Can be used anywhere on the track. The Nolan Rerailer is the only one that has a self-contained lock.

Size of Rerailer	*For Use on Rails as Follows:*	*Locomotive or Car Capacity*	*Price Per Pair*
No. 2	16 lbs. to 40 lbs.	10 tons	37.50
No. 3	30 lbs. to 60 lbs.	15 tons	42.50
No. 3½	40 lbs. to 80 lbs.	20 tons	48.50
No. 4	50 lbs. to 75 lbs.	40 tons	59.00
No. 5	70 lbs. to 100 lbs.	100 tons	90.00
No. 6	100 lbs. to 152 lbs.	200 tons	182.50

F. O. B. Bowerston, Ohio

Send Order Now! Immediate Delivery. Complete Satisfaction Guaranteed! Free Descriptive Literature If Desired!

THE NOLAN COMPANY, 106 Pennsylvania Street Bowerston, Ohio

SEARCHLIGHT SECTION

EMPLOYMENT • BUSINESS • OPPORTUNITIES • EQUIPMENT—USED or RELEASED

UNDISPLAYED RATE:
Not available for equipment advertising
90c a line. Minimum 4 lines. To figure advance payment count 5 average words as a line.
(See ¶ on Box Numbers.)
POSITIONS WANTED (full or part-time individual salaried employment only), ½ the above rates.
PROPOSALS, 90 cents a line an insertion.

INFORMATION:
BOX NUMBERS in care of any of our New York, Chicago or San Francisco offices count 10 words additional in undisplayed ads.
DISCOUNT OF 10% if full payment is made in advance for four consecutive insertions of undisplayed ads (not including proposals).

DISPLAYED RATE
The advertising rate is $7.25 per inch for all advertising appearing on other than a contract basis. Contract rates quoted on request.
AN ADVERTISING INCH is measured ⅞ inch vertically on one column, 3 columns—30 inches—to a page. C.A.

NEW ADVERTISEMENTS received by 10 A.M. August 17th will appear in the September issue subject to limitations of space available

MINE FOR SALE

The Hoosier Mine at Mt. Olive, Illinois

The top improvement and tipple were destroyed by fire in 1941. This is an 8 foot vein of coal that has had industrial and consumer acceptance for years. Fully developed below with excellent operating condition. 3000 acres of coal rights served by Wabash and Illinois Central on Route 66 Highway to St. Louis. Write

JOHN HITTEMEIR
MT. OLIVE, ILLINOIS

REPLIES (Box No.): Address to office nearest you
NEW YORK: 330 W. 42nd St. (18)
CHICAGO: 520 N. Michigan Ave. (11)
SAN FRANCISCO: 68 Post St. (4)

POSITIONS VACANT

POSITION AVAILABLE for Mining Engineer not over 30 years of age. Must know mechanical mining. Give experience, reference and salary expected. Location southern West Virginia. P 5436, Coal Age.

WANTED: MECHANICAL Engineer with minimum of three to five years' experience in designing or operating modern coal cleaning plant. Permanent position with substantial, well-established Midwestern coal company. Salary, depending on background, $5,000 to $6,000 per year. Reply P 5875, Coal Age.

ELECTRICAL ENGINEER with experience and capable of circuit designing and selling transportation companies and mines, electrical equipment. Permanent position. Any replies will be held strictly confidential. P-6015, Coal Age.

BUSINESS OPPORTUNITY

Coal Mine

80 Acres—Cent. Ohio. 35 T. daily; can increase; mod. 175 T. tipple; 24 cars; Jeffery Mach. and loco.; employ 8; sell a/c death; big demand. Apple Co., Brokers, Cleveland, O.

COAL LANDS

Suitable for strip mining. Complete details upon request.

G. B. LORRAINE
Law Building Richmond 19, Va.

PROVEN COAL ACREAGE WANTED

Deep or strip; lease or purchase. In large areas—5 million tons, upward. Submit complete information including maps, drill reports, proximity to railroads, and all other pertinent data.

SUNNYHILL COAL COMPANY
Pittsburgh, Pa.

WHEN *Answering Advertisements* PLEASE *do not send original letters, certificates or photographs. We cannot be responsible for their return. Please send photostat or carbon copies.*

WANTED

—TRANSFORMERS—

TRANSFORMERS WANTED

in operating condition or burnt out. Mail us list giving complete nameplate data and stating condition.

We Rewind, Repair and Redesign All Makes and Sizes
ALL TRANSFORMERS GUARANTEED FOR ONE YEAR

THE ELECTRIC SERVICE CO., INC.
"AMERICA'S USED TRANSFORMER CLEARING HOUSE"
Station M Since 1912 CINCINNATI 27, OHIO

WANTED

One (1) only USED HOIST for Shaft Sinking Service. Specifications as follow—200 HP, 2,200 volts, 3 phase, 60 cycles. Rope pull: 11,500 pounds, plus or minus 10%. Speed: 500 FPM, plus or minus 10%. Rope capacity: 1,400 feet, 1" diameter. Solenoid or similar type safety brake, in addition to operating brake. Single rigid drum. Complete with all electrical controls. Prefer: Sectionalized frame, and split drum. Post Type Brake.

For further information, communicate with
Mr. E. J. Morse, Tennessee Copper Co., 61 Broadway, New York 6, N. Y.

WANTED

¾ to 5 yard Shovels
2 to 10 yard Draglines

Tractors and Dozers

Frank Swabb Equipment Co., Inc.

Hazleton National Bank Building
Hazleton, Pa.
Telephones 4911 and 4910J

WANTED

One of our clients desires to purchase used coal washing equipment. Any offering of available **used** cleaning units will be appreciated. Communicate with:

TEMPLETON-MATTHEWS CORPORATION
905 Syramore Buildings, Terre Haute, Indiana

WANTED

Three (3) Euclid bodies, rear dump, to fit Model 27FD or 2FD.

HARRIS-WALSH, INC.
37 Lackawanna Ave. Scranton 3, Pa.

WANTED:

Steam Hoisting Engine, second motion, four foot diameter drum, or larger.

SWAN CREEK MINING CO.
St. Charles, Mich.

TO HELP YOU . . .

find equipment you need

"Searchlight" Advertising

1—100-KW. West. 6-phase, pedestal type, 275 volt Rotary Converter only.
1—150-KVA. Burk A.C. generator with direct connected exciter and switchboard, 440 volt, belt driven.
2—150-HP. General Motors Diesel Engines with 100-KW. G.E. generators and switchboards, 250 volt D.C., 1,200 RPM. (new).
1—60-HP. General Motors Diesel engine only, model 4-71.
1—100-HP. Buda Diesel engine, model 6LD468.
1—Gardner-Denver, all bronze centrifugal pump, 1,000 GPM. 280′ head.
1—50-HP. Single drum hoist with 220 or 440 volt A.C. motor and control.
1—Sullivan double drum hoist, Type B-211 with 30-HP. West. S.K. motor.
2—4-Ton G.E. type 825 low vein locomotives.
1—6-Ton Plymouth gasoline locomotive.
1—8-Ton Plymouth gasoline locomotive.
1—Jeffrey crab reel complete.
3—200-KVA G.E. Transformers, 7620/1320Y to 2,300 volt.
2—10-KVA and 1—7½-KVA. G.E. transformers, 2,300 to 110/220 volt.
1—1,000 amp. West. welding machine with automatic controls.
12—15″ Walker-Turner and Delta bench drills complete with 1/3-HP. motors.
1—Two-stage Worthington air compressor with 25-HP. D.C. motor.
1—Morrow 125-T.P.H. high speed shaker screen, self contained, 3-grades.
29—Sanford Day drop bottom mine cars, 36″ gage.
8—Sanford Day side dump rock cars, 36″ gage.
35—55-gallon drums transformer oil.

A.C. and D.C. motors, speed reducers, fans, blowers and other items of machinery and supplies in stock and ready for immediate delivery. Many other items available at all times. Your inquiries appreciated.

R. C. Jones & Company
2106 13th St., Ashland, Ky. Phone 610

TIPPLE

We have for sale one used five (5) track tipple, Capacity of 4000 tons per day complete with Shaking Screens, Three (3) loading booms, Crushers and Vibrators, feeder, and a 42-inch belt conveyor, app. 190 ft. center to center. This adaptable to Slope or Strip mine, knocked down, match-marked for erection, and located on RR siding and can be loaded immediately. "Have all blueprints, erection drawing, etc."

ALSO: have one Fairbanks-Morse Diesel Electric Generating Unit (AC, 220-440 Volt, 360 HP, 300 KVA).

ALSO: Three (3) Used Fifteen (15) ton SANFORD DAY Bottom Dump Coal Haulage Trailers.

All subject to prior sale. If interested, wire, write or phone for further particulars.

DOWN STATE COAL CO., INC.
P. O. Box No. 269, Marion, Illinois
Phone: Herrin, Ill. 23181

FOR SALE

3—24" Conveyor Systems complete with 16" screw conveyor feeders, gear motors, troughing idlers, head and tail pulleys, belt, etc. (2—900' center distances and 1—500' center distance). All Link Belt—equivalent of new.

1—Vulcan 2-drum Steam Hoist, 26⅜ bore x 72" stroke, two conical drums 8' long each, small end of drum: 8' diam., large end of drum: 9' diam. It is lagged for 1⅝" rope—will hold approx. 800'. Rope speed approx. 1,000' per minute.

CHARLES V. FISH
501 Commonwealth Bldg.
Allentown, Penna.

for IMMEDIATE DELIVERY *of* RUBBER PRODUCTS

CONVEYOR BELTING, TRANSMISSION BELTING, ELEVATOR BELTING, FIRE, WATER, AIR, STEAM, SUCTION and WELDING HOSE.

CALL WIRE WRITE **CARLYLE**
THE RUBBER HEADQUARTERS

CARLYLE RUBBER PRODUCTS ARE NEW, GUARANTEED & LOW PRICED

NEW GUARANTEED

CONVEYOR BELTING

ABRASIVE RESISTANT COVERS

Width	Ply	Top-Bottom Covers
48″	8	1/8″ — 1/16″
42″	5	1/8″ — 1/16″
36″	6	1/8″ — 1/16″
30″	6	1/8″ — 1/16″
30″	5	1/8″ — 1/16″
26″	5	1/8″ — 1/32″
24″	5	1/8″ — 1/32″
24″	4	1/8″ — 1/32″
20″	5	1/8″ — 1/32″
20″	4	1/8″ — 1/32″
18″	4	1/8″ — 1/32″
16″	4	1/8″ — 1/32″
14″	4	1/16″ — 1/32″
12″	4	1/16″ — 1/32″

Inquire For Prices — Mention Size and Lengths

TRANSMISSION BELTING

HEAVY-DUTY FRICTION SURFACE

	Width	Ply	Width	Ply	Width	Ply
Inquire For Prices — Mention Size and Lengths.	18″	6	10″	6	6″	5
	16″	6	10″	5	5″	5
	14″	6	8″	6	4″	5
	12″	6	8″	5	4″	4
	12″	5	6″	6	3″	4

ENDLESS "V" BELTS

"A" Width All Sizes —
"B" Width All Sizes —
"C" Width All Sizes —
"D" Width All Sizes —
"E" Width All Sizes —

Sold in Matched Sets.
Inquire For Prices — Mention Size and Lengths.

SPECIAL OFFER . . . HEAVY DUTY RUBBER HOSE

FIRE HOSE

APPROVED SPECIFICATION HOSE EACH LENGTH WITH COUPLINGS ATTACHED

I.D. Size	Length	Per Length
2½″	50 feet	$28.00
	25 ″	16.00
2″	50 ″	23.00
	25 ″	13.00
1½″	50 ″	20.00
	25 ″	11.00

Specify Thread On Couplings

AIR HOSE

I.D. Size	Length	per Length	Universal Couplings
½″	25 feet	$5.00	$1.50 Pair
	50 ″	10.00	1.50 Pair
¾″	25 ″	7.50	1.50 Pair
	50 ″	15.00	1.50 Pair
1″	25 ″	10.00	1.50 Pair
	50 ″	20.00	1.50 Pair

LARGER SIZES ALSO AVAILABLE
All Prices—Net — F.O.B. New York

WATER HOSE

I.D. Size	Length	per Length
¾″	25 feet	$4.25
	50 ″	8.00
1″	25 ″	6.25
	50 ″	12.50
1¼″	25 ″	7.50
	35 ″	10.50
	40 ″	12.00
	50 ″	15.00
1½″	25 ″	10.00
	35 ″	14.00
	50 ″	20.00

Each Length with Couplings Attached

CARLYLE RUBBER CO., Inc.

62-66 PARK PLACE, NEW YORK 7, N. Y. Phone: BArclay 7-9793

FOR SALE

COAL CUTTING MACHINE

Sullivan Model #7AU, 42" gauge, 9 ft. cutter bar, heavy duty type head, permissible, 250 volts, DC, late type, excellent condition.

Also

COAL LOADING MACHINE

Goodman Model #460, 42" gauge, permissible, 250 volts, DC, late type, Excellent condition.

FS 5832, Coal Age,
330 West 42nd St., New York 18, N. Y.

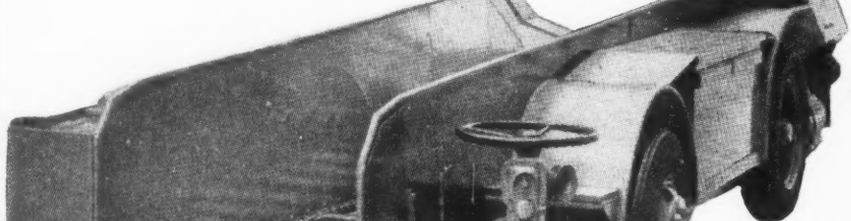
FOR SALE

1—100 H.P., Wellman-Seaver, Morgan Hoist, double drum direct connected to 100 H.P., 220 volt GE Motor, Serial No. 5215684 with starting and reverse panel, electric brake. Located at Crawford, Tenn.

LOVE AND AMOS COAL COMPANY
1805 West End Avenue
Nashville 4, Tennessee

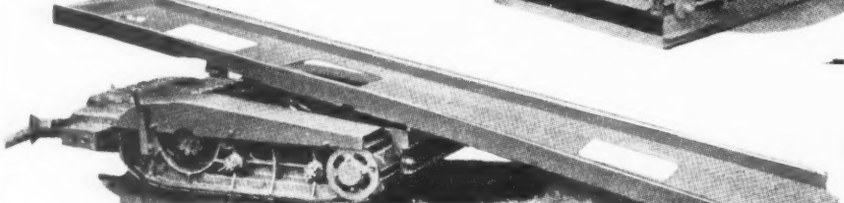
COMPLETE LIQUIDATION
IMMEDIATE DELIVERY

. . . New and nearly new coal mining machinery and equipment



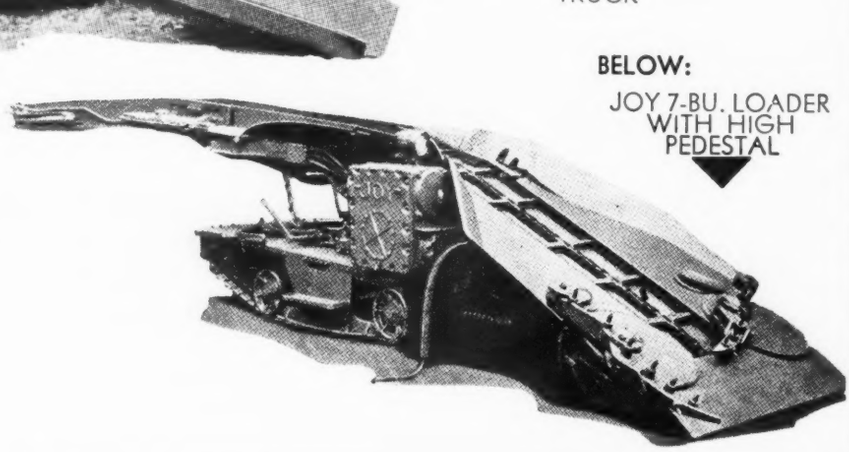
LEFT:
JOY 42-D
SHUTTLE CAR

RIGHT:
JOY
SHUTTLE CAR
WITH ELEVATING
CONVEYOR



LEFT:
JOY "T-1"
MINING MACHINE
TRUCK

BELOW:
JOY 7-BU. LOADER
WITH HIGH
PEDESTAL



EXIDE AND GOULD
IRONCLAD BATTERIES

THE COLUMBINE MINE EQUIPMENT CO., INC.

FLAT IRON BUILDING, 1669 BROADWAY **DENVER 2, COLORADO**

Subsidiary of Portland Equipment Co., 11 Broadway, New York 4, N. Y.

SEE PAGE 209 FOR APPROXIMATE SUMMARY OF HARD-TO-GET OFFERINGS

THE COLUMBINE MINE EQUIPMENT CO., INC.

1669 BROADWAY, DENVER 2, COLORADO

...New and nearly new coal mining machinery and equipment

Subsidiary of Portland Equipment Co., 11 Broadway, New York 4, N. Y.

Complete Liquidation . . . Immediate Delivery

Here are some of the HARD-TO-GET OFFERINGS

(While They Last)

1—10 ton Jeffrey locomotive 36" ga. (trolley type), 250 v. D.C.

3 ton, 4 ton, 6 ton, 8 ton, 10 ton, 15 ton, and 20 ton G. E., Westinghouse, Jeffrey and Goodman locomotives.

COAL MINING MACHINES—20 L-E "Arcwall" Jeffrey mining machines mounted on Joy electrically driven caterpillar trucks.
Goodman Shortwall No. 112 mining machines.
Goodman 36" gauge TRUCKS, Type "M."

MINING MACHINE TRUCKS—Joy "T-1."

MOTOR GENERATOR SETS—1 set 225 H.P. connected to Ridgeway 150 K.W. generators, with panelboards, A.C. and D.C. meters and transformers complete. 1 set 300 H.P. connected to Ridgeway generators, 200 K.W., complete with panelboards, A.C. and D.C. meters and transformers. And others.

BATTERY CHARGING UNITS—Joy, Westinghouse, Hobart Bros. Co., Electric Products Co.

MOTORS—A.C. and D.C., all types, 1 H.P. to 300 H.P.; starting compensators and switches.

TRANSFORMERS—General Electric, Westinghouse, 7½ KVA, 37½ KVA and 150 KVA.

BOX CAR LOADERS—Ottumwa-Manerre.

PUMPS—Geared and centrifugal—motor and belt driven—Gould, Demming, and Myers.

FANS—American Blower, Sturdevant.

TIPPLE—3 track tipple consisting picking screens, grizzlies, car retarders, end dump, belt conveyors, elevator bucket conveyors, box car loaders complete.

VIBRATOR SCREENS—Ty-Rock Tyler F-600 2 surface 5'x10' Screen, full floating.

SHAKER SCREENS—"Marcus" shaker screens.

CONVEYORS—Flight conveyors, elevator conveyors.

COAL CRUSHERS.

RAILS—150 tons 60 lb., 150 tons 65 lb.

SPIKES, bolts, tie plates, frogs, switches, switch throws.

COPPER trolley wire—2/0, figure 8 and 4.0 round.

TROLLEY HARDWARE—Hangers, clamps, frogs, switches, roof hangers.

TRANSMISSION WIRE—Single conductor, 2 conductor, 3 conductor—Neoprene, glass, rubber insulated 2/0 to 500,000 CM. New.

JOY 7-BU. LOADERS—Caterpillar mounted with high pedestal.

SHUTTLE CARS—Joy 42D storage battery.

ELEVATOR CONVEYORS—Joy.

AIR COMPRESSORS.

MACHINE SHOP—Complete.

ELECTRIC SHOP—Complete.

CARDOX PLANT—Complete.

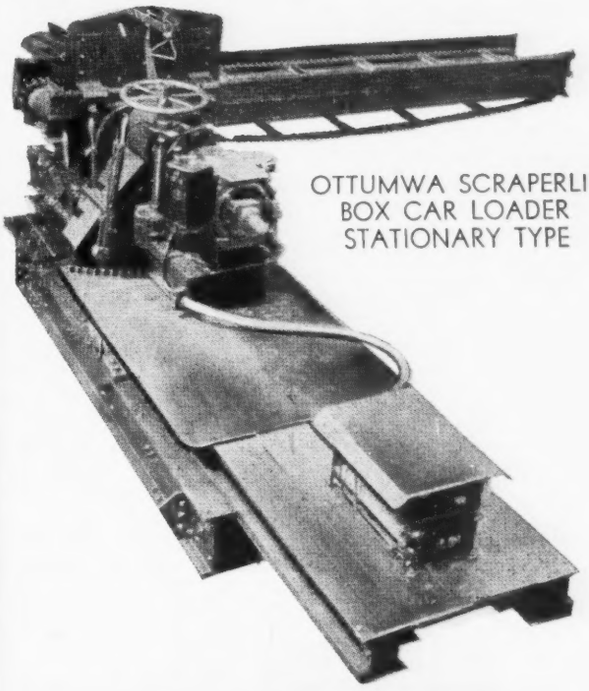
BATTERIES—Exide and Gould Ironclad, 24 cells.

$150,000.00 WORTH of new parts, bearings, gears, bolts, nuts and screws for Joy, Jeffrey, Goodman, Ottumwa, Manerre, General Electric, Westinghouse, Demming, and other popular manufacturers' equipment.

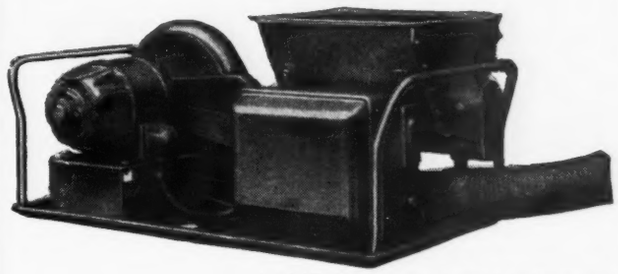
ROTARY CAR DUMPER for 36" gauge Cars With Automatic Control.

HOISTS—1 Double Drum Conical Hoist—Denver Engineering Works—300 HP., Silent Chain Drive, Complete With All Panelboards, Transformers and Controllers and Numerous Others.

ALSO THOUSANDS OF ITEMS TOO NUMEROUS TO MENTION



OTTUMWA SCRAPERLINE BOX CAR LOADER STATIONARY TYPE



MINE SAFETY APPLIANCE CO. ROCK DUSTER

GOODMAN TYPE 112 SHORTWALL COAL CUTTER

WRITE FOR OUR COMPLETE LIST OF MACHINERY AND EQUIPMENT

MOORHEAD ELECTRICAL MACHINERY CO.
PITTSBURGH 19, PA.

M-G SETS—ROTARIES
(3 ph. 60 cy.)

500 KW Dest. factory built M G Set—running inspection—consisting of 500 KW 250 v. 900 RPM cpd. interpole dir. conn. common base 714 HP Syn. Motor 8 P.F. 2300 v. with manual starting panel including magnetic excitation relays. also standard DC Panel. Good condition. Immediate shipment.
300 KW 250 v. G.E. 600 RPM Rotary Bare.
300 KW 250/125 v. con. 2-150 KW West. SK 125 v. Gen. dir. con. 450 HP Motor.
200 KW G.E. Rotary 275 v. 1200 RPM. Type HCC-6 with 3-65 KVA 2300/4000 v. Trans.
100 KW West. SK 125 v.—150 HP West. Ind. 1200 RPM. 220/440 v.
150 KW West. 125 v.—250 HP Ind. 2200 v.
100 KW 250 v. G.E.—150 HP Ind. West.
75 KW 75 v. West.—100 HP West. Ind.
50 KW 125 v. G.E.—75 HP G.E. 2200 v.
40 KW 250 v. West.—60 HP West. Ind.
15 KW 125 v. Wotten—25 HP 220/440 v.
10 KW 125 v.—15 HP Master, 220/440 New.

AC AND DC GENERATORS

45 KW 250 v. S West. 1000 RPM.
60 KW 60 v. 1000 amp. West SK Welding.
1 150 KW West. SK 125 v. 1200 RPM.
300 KW West. 250 v. 1200 RPM.
150 KW G.E. Type RC 550 v. 1150 RPM.
90 KW 60 v. 1500 amps. West. SK.

AIR COMPRESSORS

1100 cu. ft. 100 lbs. Chg. Pneu. 2 stage, 19" & 12"x12" with Intercooler, aftercooler, unloader, air receiver dir. conn. 215 HP West. Syn. Motor 2200 v. 3 ph. 60 cy. 257 RPM with belted 8 KW SK West. exciter and manually operated starting panel. Good condition. Immediate shipment.
750 cu. ft. 100± pres. Chic. Pneu. 2 stage Type OCB 17 & 10 x 12".
356 cu.ft. 100± pres. Chic. Pneu. 12 x 10.
245 cu. ft. 100± pres. Ing. Rd. ER1, 10 x 10.
175 cu. ft. 100± pres. Chic. Pneu. 9 x 8.
164 cu. ft. Ch. Pneu. Steam Type.

AC MOTORS (3 ph. 60 cy.)

HP.	Make	Wdg.	Spd.	Type
450	G.E.	S.R.	257	I M
300	West.	S.R.	600	CW
300	G.E.	S.R.	450	I M
250	Al.Ch.	S.R.	600	
150	G.E.	S.C.	435	I K
150	G.E.	Swn.	600	ATI
125	West.	Syn.	277	
100	G.E.	S.R.	450	I-M
80	G.E.	S.R.	900	MTC
75	West.	S.C.	450/900	CS
75	G.E.	S.R.	600	I M
75	G.E.	S.R.	575	ITC
75	Al.Ch.	S.C.	900	
50	G.E.	S.C.	900	IK
50	West.	S.R.	600	CW658 D
50	G.E.	S.R.	900	I M
50/12½	G.E. 2200 v.	S.R.	900/450	I M
25	Cr.Wh.	S.R.	580	
25	Cr.Wh.	S.C.	860	

LOCOMOTIVES
Haulage and Gathering Locomotives

20 Ton Jeff. & G.E. 550 v. 42" Ga.
(Can be rewound 250 v.)
13 Ton West. 260 x. 36 or 40" Ga.
8 Ton Goodman Explosion tested 500 v. 42/44" Ga.
6 Ton West. 250 v. 904 Motors 36" Ga.

STORAGE BATTERY LOCOMOTIVES

6/7 Ton Jeffrey 42/44" Ga. BB Motors.
6 Ton G.E. perm. 36/44" Ga. HM 825 BB.
5½ Ton Ironton Type A 36/42 Ga.
CE 7 Sullivan 250 v. 6' cutter bar.

DC MOTORS

HP.	Make	Voltage	Wdg.	Speed
15	West. SK 110	230	cp.	750
15	West. SK 83	230	cp.	950
15	Cr. Wh. CM	230	sh.	1400/1700
20	West. SK70L	230	cp.	1750
20	Cr. Wh. CMC	230	sh.	1200/1700
20	G.E. DLC	500	sh.	400/1200
20	West. SK 110	230	sh.	900
25	West. S.	230	sh.	325/975
25	West. SK 113	230	cp.	900
40	G.E. RC 34	230	sh.	750
40	G.E. RC	230	sh.	1150
50	West. SK	230	sh.	1750
50	West. S	230	cp.	875
60	Rel. T461	230	sh.	860/1200
125	West. SK 193	230	sh.	450/1000
200	G.E. RC	500	cp.	875
375	West.	230	cp.	430/860

ENGINE & TURBINE UNITS

50 KW West.—Turbo 125 v.
75 KVA G.E. 110/220/440/3/60 1200 RPM G.E. Diesel Eng. auto control.
100 KW Delco 250 v. Gen.—Superior Diesel.
300 KW West. 125/250 v. DC—West. Turbine 440± Pres.
2-400 KW G.E. 250 v.—Skinner Steam Eng.

HOISTS, CRANES AND PUMPS

400 HP Vulcan conical drum shaft Hoist.
400 HP Vulcan single fixed cylindrical drum 78" dia. 5' 4" wide—AC Motor.
75 HP Diamond agl. fr. 48" dia. 25" face.
75 HP Mead Morrison sgl. fr. drum—AC Motor.
1—50/75 HP 2 drum Meade Morrison slope.
40 HP Ligerwood sgl. ft. drum geared to A.C.
25 HP sgl. friction Hoist—230 v. DC Motor.
10 Ton Larry Car, 500/250 v. DC.
10 HP Fridy Car Puller, AC Motor.
Lawrence Cent.—50 HP, AC Motor.
Gardner Cent.—50 HP, 230 v., DC Motor.
Weinman Cent.—50 HP, 230 v., DC Motor.

TRANSFORMERS

Qu.	KVA	Make	Prim. V.	Sec. V.
3	200	Pgh.	2200	220/440
3	150	Westgh.	2200	220/440
3	15	Penna.	2200	110/220
5	10	Penna.	2200	110/220
3	10	West.	2200	110/220

DC MAGNETIC STARTERS

3— 10 HP 230 v. Mag. Rev. Dyn. Braking.
1— 25 HU C.H. 230 v. dripproof.
4— 30 HP EC & M. 230 v. Magnetic.
3— 40 HP W.L. 230 v. dripproof.
4— 60 HP C.H. 230 v. dripproof.
4— 75 HP C.H. 230 v. dripproof.
1—100 HP C.H. 230 v. dripproof.
1—150 HP C.H. 230 v. dripproof.

AC MAGNETIC STARTERS

6—13¼ Clarke Mche. Tool 440/3/25 cy.
2—700 HP West. 220/3/60 Line Starters.

MOTOR GENERATORS

500 KW G.E. SYN. 275 V. 2300/4000 V. 3PH. 60 CY. 900 RPM. COMPLETE MANUAL SWITCHGEAR.
500 KW G.E. SYN. 575 V. 2300/4000 V. 3PH. 60 CY. 900 RPM. COMPLETE MANUAL SWITCHGEAR.
400 KW WEST. SYN. 575 V. 2300/4000 V. 3 PH. 60 CY. 720 RPM. COMPLETE MANUAL SWITCHGEAR.
300 KW G.E. SYN. 275 V. 2300/4000 V. 3 PH. 60 CY. 720 RPM. COMPLETE MANUAL SWITCHGEAR.
250 KW G.E. SYN. 275 V. 2300/4000 V. 3 PH. 60 CY. 720 RPM. COMPLETE MANUAL SWITCHGEAR.

SYNCH. CONVERTERS

300 KW G.E. 575 V. 6 PH. 60 CY. 1200 RPM Pedestal Type. 2300/4000 V. TRANSFORMERS and SWITCHGEAR.

LOCOMOTIVES

30-T Jeffrey 250 V.MH-77 Mts. 48"-36" Ga.
20-T Jeffrey 250 V.MH-77 Mts. 44"-36" Ga.
15-T Jeffrey 250 V.MH-77 Mts. 48"-36" Ga.
13-T Jeffrey 250 V.MH-110Mts. 42"-32" Ga.
10-T Jeffrey 250 V.MH-110Mts. 42"-32" Ga.
10-T West. 250 V. 907-C Mts. 36"-44" Ga.
8-T West. 250 V. 906-C Mts. 42"-48" Ga.
6-E West. 250 V. 903-B Mts. 22"-32" Ga.
6-T G.E. 250 V. HM-701 Mts. 22"-32" Ga.

Each unit listed above is owned by us and is available now for immediate purchase.

WALLACE E. KIRK CO.
501 Grant Building Pittsburgh, Pa.

FOR SALE

BARE COPPER CABLE
250,000—500,000—1,000,000 CM. Also 4/0 Round and Grooved Trolley.

MINE CARS
Rotary Dump 48" Gauge—29" high.

HOISTS
Single and Three Drum—New.

HAND WINCHES
All-Steel—Three-Ton Capacity.

TANK
4,000 Gallon—2 Compartment.

I BEAMS
10"—35# to Foot.

ROTARY CONVERTERS
General Electric, 100 KW, 3 Phase.

MANSBACH METAL COMPANY
Logan, W. Va. Phone 1071
All Items Priced to Sell — Send us your inquiries.

LOCOMOTIVES & CRANES

80 ton Lima 6 wheel Switchers. New 1944.
65 ton Whitcomb Diesel-Electric. New 1944.
50 ton Gen. Elec. Diesel-Electric.
70 ton Porter Fireless steam locomotive.
30 ton Plymouth Gas Locomotive. New 1944.
2 yd. Lima Diesel Crawler Crane. 100' bm.

MISSISSIPPI VALLEY EQUIPMENT CO.
511 Locust St. St. Louis, Mo.

NEW and REBUILT
STORAGE BATTERY
LOCOMOTIVES
1½ to 10 Ton 13" to 56" Track Gauge
GREENSBURG MACHINE CO.
Greensburg, Pa.

Shovels-cranes, 1¼, 1½, 2, 2½, 4, 5-yd.
Marion 492 elec. shovel, 5-yd., 1948.
Draglines, 3, 3½, and 5-yd., Diesel & electric.
Loco. cranes, 40-ton Diesel; 25-ton gas & steam.
Fairbanks-Morse Diesel engine, 575 HP, 1944.
Plymouth 10-ton gas locomotive, 36" gauge.
Steam locos., 17 to 52 tons, various gauges.
Gas & Diesel locomotives, 7 to 45 tons.
B-Erie 2-1/3 yd. shovel, front att. (52B-55B).

H. Y. SMITH CO., 828 N. B'way, MILW. 2, WIS.

BARGAINS IN MINING EQUIPMENT

PUMPS

Peerless and Layne and Lowler Deep Well Pumps, from 4" to 8".
Ingersoll-Rand High Head Motor Mounted Pumps from 1 H.P. to 25 H.P.
Several Sizes Triplex, Piston, and Centrifugal Pumps.

GENERATORS—DIESEL

4—D-13000 Caterpillar Diesel Generators, 75 KW, 440 Volts A.C.
1—D-4400 Caterpillar Diesel Engine, v-belted to 30 KVA, 220 Volt AC Generator.

BELT CONVEYORS

1—16" 75' Long, with 5 H.P. Gearhead Motor.
2—24" 15 to 75' Long, with Ding's Pulleys.
1—24" 30' Long, with 5 H.P. Gearhead Motor.
1—28" 30' Long, with 2 H.P. Gearhead Motor
1—30" 70' Long, with Driving Mechanism.
1—36" 50' Long, with Driving Mechanism.

STEEL TANKS

1—8'6" x 29'8" Steel Army Bolted Type, Open Top, Cap. 44,000 Gals.
1—6' x 18' Steel Horizontal Closed Tank.

MAGNETIC PULLEYS

1—24" Dia. x 26" Face Stainless Steel Ding's Magnetic Pulley, complete with charger.

COAL CUTTERS

5—Sullivan CE-7 AC Short Wall, complete with Standard and Tip-turn Trucks, most machines with Power Cable.

TROLLEY LOCOMOTIVES

2—7½ Ton Goodmans, 36" Gauge, 250 Volt D.C.

MACHINE SHOP EQUIPMENT

2—Drill Presses 16" to 26".
1—200 Amp. Smith Welder—on wheels.
1—Power Hack Saw, B.D.
Bolt and Pipe Threaders, Chain Blocks.
Swing Cranes with Crawls, Wood Planer.
Saw Table, Hand Shears, etc.

COAL WASHING EQUIPMENT

2—Rheolaveur Launders, complete with Steel Supporting Frame.
1—60" Dia. Dividing Table, direct connected to 2 H.P. D.C. Motor.
1—Galigher Auto. Sampler with adjustable stroke and direct connected to a 1/6 H.P. Motor.
1—12' x 10' Steel Hopper Bin.
1—70' x 12' Dorr Thickener Tank, complete with mechanism.

COAL CRUSHERS

1—36" St. Louis Ring Type.
1—24 by 20 Jeffrey Swing-Hammer Mill.

RAILROAD SCALES

2—100 Ton Fairbanks, Steel I Beam Stringers, Inspected by W.W.&I.B. in April, 1947.

MOTORS

New and Used AC Motors, 1½ H.P. to 40 H.P.
Used DC Motors, 10 H.P. to 75 H.P.

RAILS

50 Tons—65# Relayers.
25 Tons—40# Relayers.

MINE FANS

1—8-H60 Aerodyne Exhausting Fan, with Air Locks, Hood, etc. 75 H.P. Motor—Purchased new in 1942.

HOISTS

1—No. 22 Vulcan, with Man Cage, 30' Steel Headframe and 40 H.P. Single Speed Elevator Type Motor, equipped with Solenoid Brake. (Hoist purchased new in 1942.)
1—Single Drum Gasoline Hoist, direct connected to 2⅝ x 4¼ Wisc. Gas. Engine.
1—15 H.P. Single Drum Hoist, direct geared to motor with Controller and Grids.

LARRY CARS

4—Connelsville Larry Cars, Trolley Operated, 6 Ton Capacity.

PIT CARS

160 Card Iron Works R.B. Pit Cars, 36" Ga.
1 Card Iron Works Rock Car, 90 Cu. Ft. Cap.

TRACTORS

2—Diesel Caterpillar 50 Tractors, with 10' Angle Dozers.

WRITE FOR OUR NEW SPRING BULLETIN NO. 9

FLORENCE
MACHINERY AND SUPPLY COMPANY

SUITE 904, EQUITABLE BUILDING **DENVER 2, COLORADO**

C. J. Parrish, Mgr.
Phone: Alpine 2803
Yards: Denver and Florence, Colorado

"VENTILATION AT A BARGAIN"

AXIAL FLOW FANS

CFM	S.P.	Overall Size	Make	Motor	HP	RPM
35000	1"	48" x 66"	Wing	230 v DC	14.5	1290
12000	3"	36" x 38"	Sturtevant	3/60/440	10/3	1775/1180
10000	3"	30" x 40"	Clarage	3/60/440	7.5/3.3	1750/1160
5000	3"	30" x 36"	La Del	3/60/440	4	1750/1150

Large quantities — Brand new — Immediate delivery
All at a fraction of the original cost

WINCHES

1 drum — 2 gypsies
capacity: 100000# pull at 10 FPM
to: 3000# pull at 400 FPM
stowage: 900 ft. of 1⅝" steel wire rope
power: 50 HP W'hse 230 V DC Motor, 500/1800 RPM, variable speed

HUGO NEU CORPORATION
31 Nassau Street New York 5, N. Y. Tel. REctor 2-1334

FOR SALE

1—Chuse Engine 18"x16" Bore, 225 RPM, Shop No. 1799 connected to Gen. Electric Direct Current, 250 Volt, 300 Amps., Generator type. T.D.R.—7-6-75 KW, 300 Amperes, working pressures 150# and 15#.

1—Murray 4 Stage bleeder type Turbine, directly connected to Crocker Wheeler Generator. Turbine #1130 Steam pressure, 150# and 27" Vacuum. Extraction pressure 40# output in HP, 140 output in KW 75, RPM 5,270. Generator 1,800, 250 Volts Direct Current, 300 Amperes, #712913.

1—Ideal Engine direct connected to a 75 KW Crocker Wheeler Generator. The above engines and generators can be seen in operation at this time. Other engine and boiler room equipment will be available.

BOOTH COLD STORAGE COMPANY
1220 N. Main St. St. Louis 6, Mo.

LOCOMOTIVES FOR SALE

2—65 ton, Whitcomb diesel-electric, new 1943, 566 HP, tractive effort 43,300#.
1—45 ton, Davenport, diesel-electric railway type, new 1942, four traction motors, rear end cab.
2—25 ton, General Electric, diesel-electric, new 1942, Cummins diesel unit, speed 20 MPH.
2—80 ton type 0-6-0 steam switching locomotives, new 1942-44, 21"x28" cylinders, tractive effort 40,000#.

LOCOMOTIVE CRANE

30 ton Capacity Browning Model 3-G, serial 3181, new 1943, 60' boom, double drums, excellent condition.

AIR DUMP CARS

Six 22 cu. yd. Austin Western air dump cars, cast steel truck side frames, lift door type, ready to work.

SPECIAL — FORGING MACHINE, NEW 1945 — ACME MODEL "XN"

Our stock includes many other locomotives, cars cranes and heavy equipment items.
We invite your inquiries.

Write — Phone — Wire

PAN-AMERICAN ENGINEERING CO.
P. O. Box 2576 Telephone L.D. 339
Dallas Texas

HIGH GRADE TOOLS

18"x8' American Screw Cut. Engine Lathe.
#500 UK Hanchett Face Grinder.
#104-2 Rivett Internal Grinder.
72x72x20 Niles Bemont Pond Planer.
42x42x20 Cincinnati Hypo Planer.
6" Pratt & Whitney Vert. Shaper.
#2B Simmons Micro Speed Turret Lathe.
24", 36" & 42" Bullard Vertical Turret Lathe.
3" Bar Fosdick Horizontal Boring Mill.
2½" Giddings & Lewis Horizontal Boring Mill.
2 1/3" Giddings & Lewis Horizontal Boring Mill.
20"x12' Boye & Emmes Lathe.
24"x16" American Geared Head Lathe.
2' to 6' Plain Radial Drills.
16" and 24" G & E Shapers.
150-ton Wheel Press.
New No. 3 Davis Keyseating Machine.
Also various other machine tools.

Send us your inquiries

Cincinnati Machinery Company, Inc.
217 E. Second St. Cincinnati 2, Ohio

FOR SALE

4 Goodman Style G20B77 permissible Shaker Conveyors, latest type with 300 ft. size 3 troughs, manual Type HAD duckbill and 20 HP Westinghouse AC motor, 3 phase, 60 cycle, 220 volt, 1160 RPM.
4 Sullivan Class 7B Cutting Machines, with 50 HP AC motor, 3 phase, 60 cycle, 220 volt, and Bowdil cutter bar and chain, 9 ft. long, 5" kerf.
4 Chicago Pneumatic Style 574-700 post mounted coal drills, 220 volt, 60 cycle, 3 phase, AC.

All of above to include usual accessories and guaranteed to be in A-1 condition. New in 1943.

KAISER COMPANY, INC.
Iron & Steel Division
Sunnyside, Utah

ELECTRIC HOISTS

1—3-ton Shepard Electric Hoist, 250 V., D.C., 22' lift.
2—1-ton Electric Hoists, same as above.

CHAIN BLOCKS

2—6-ton Chain Blocks in good condition.
1—2½-ton Chain Block.

TIPPINS MACHINERY CO.
PITTSBURGH 6, PA.

AIR COMPRESSORS

2—175 CFM Inger. Rand 2 cyl. vert. 150 P.S.I. Type XIV dir. con. to G.E. 50 HP DC motor, 230 V. 400 RPM. Mounted on factory cast iron base. Complete with inter-cooler, unloader and access.

PHILADELPHIA TRANSFORMER CO.
Box 566 Dalton, Pa.

National

CLASSIFIED ADVERTISING

for bringing business needs or opportunities to the attention of men associated in administrative, executive, management, sales and responsible technical, engineering and operating capacities with the industries served by

The SEARCHLIGHT SECTIONS of

American Machinist
Aviation Week
Bus Transportation
Business Week
Chemical Engineering
Coal Age
Construction Methods
Electrical Construction & Maintenance
Electrical Merchandising
Electrical World
Electronics
Engineering News-Record
Engineering and Mining Journal
E & M J Markets
Factory Management and Maintenance
Food Industries
Operating Engineer
Power
Product Engineering
Textile World
Welding Engineer

For advertising rates or other information address:

Classified Advertising Division
McGRAW-HILL PUBLISHING CO., INC.
330 W. 42nd St., New York 18, N. Y.

REBUILT EQUIPMENT—READY TO SHIP

SAVE OVER 50% ON NEW INDUSTRIAL BLOWERS AND VENTILATING FANS

AXIAL FLOW VENTILATING FANS

5—50" dia. 72½" long. 2 sets of propellers, 8 blades to each. Dim: of blade 14"x9½" curved mf'd by International. Size 114, driven by 100 HP., 1750 rpm, 220/440 v. 3 ph. 60 cy. A.C. Motor.

6—16000 CFM Buffalo Forge Co., 3" stat. pres. 1800/1200 rpm. con. 15/4.5 HP., 1710/1150 rpm., 3 ph. 60 cy. G.E. A.C. Motor 220/440 v. totally encl.

2—12000 CFM 3" stat. pres. Sturtevant with dir. con. 10/3 HP., 1775/1180 rpm., 220/440 v. West. CS. TEFC Motor.

1—7500 cfm Clarage with dir. con. 7½ hp., 1750 rpm., 3.3 hp at 1160 rpm., 220/440 v. 3 ph. 60 cy.

2—6000 cfm. Sturtevant 1.65" stat. pres. dir. con. 2.7/8 hp 220/3/60 A.C. Motor.

31—6000 cfm. Sturtevant Bulletin 512389, 3" stat. pres. 7 blade, dir. con. 5/1.5 HP., 1765/1175 rpm., 220/440 v. 3 ph 60 cy. West. TEFC Motors.

2—5000 cfm Sturtevant 1.8 stat. pres. 4.2/1.25 HP., 1750/1150 rpm., 3 ph. 60 cy., 220/440 v. ball-bearing motors.

2—4000 cfm 3" stat. pres. Sturtevant dir. con. 2 speed. TE Westinghouse 220/440 v. Motors.

1—4000 cfm 3" stat. pres. Sturtevant Axial Flow vent fan dir. con. 4/1.2 HP., 1750/1150 rpm., 220/440 v., 3 ph. 60 cy. Tot. Enc. West. Motor.

HOISTS

1—Welen 2 drum 8600# per drum, each drum is 6' cir. with 430 ft. of ⅝" cable per drum can be increased to take 600'. 120 FPM per drum, driven by 25 HP., 1750 rpm., 230 V. D.C. motor.

1—Single Drum Triple Reduction Hoist, 28" dia. drum, 20" face, 1" flange, 27 grooves for ½" rope—300' of rope with 10 HP., Westinghouse A.C. Slip Ring Motor 70/80 FPM.

SPECIAL BARGAINS

11—100 kw., 250/275 v. Delco Generator dir. con. to 150 HP., GBD-8, 5½x7, 8 cyl. Superior Diesel elec. starting, with muffler, power panel and accessories. Almost new—only used as spares.

230 V. D.C. MAGNETIC STARTERS AND CONTROLLERS

456—New, 1 HP. Cutler Hammer across the line.

111—New, 1 HP. Cutler Hammer across the line.

30—New, 2 HP. Cutler Hammer across the line.

55—New, 5 HP. Cutler Hammer drip proof 2 step current limit OL and LV.

58—New 7½ HP. Cutler Hammer.

60—10 HP. Cutler Hammer Magnetic.

12—10/15 HP. 230 V. Westinghouse Magnetic Drip Proof Controllers. 2 steps acceleration thermal overload relay with stop, start and reset buttons.

9—New, 10/15 HP., 230 v. G.E.

10—New, 20/35 HP., 220 v. Ward Leonard Magnetic.

10—New, 40 HP., 230 v. G.E. Magnetic.

A.C. MOTORS 4000/2200/220/440 V.—3-Ph., 60 Cy.

No.	HP.	Make	Rpm.	Type
1	500	Elec. Mach.	120	Syn.

PUMPS — with AC or DC Motors

Qua.	GPM	Head	Make
2	1300	277'	Worthington
2	1200	300	Worthington
2	1100	323	Worthington
2 New	1000	346	Worthington
1	1000	370	Worthington
2	900	365	Worthington
8	800	378	Worthington
2	800	150	Worthington
2	700	388	Worthington
2	600	182	Worthington
1	600	220	Dayton Dowd
2	600	393	Worthington
2	400	196	Worthington
1	332	202	Worthington

D. C. GENERATORS

250 V. D.C.

No.	KW	Make	Speed
3	250	West.	1200
2	100	West.	720
1	100	G.E.	900
1 New	100	Elliott	900
4	100	West.	900
2	100	Delco	1200

"Write for Stocklist"

MOTOR GENERATOR SETS

250 V. D.C.

Motors 220/440 or 2200 v. 3 ph. 60 cy.

No.	KW	Make	Speed
1	150	West.	1800
1	100	West.	1800
2	100	Delco	1150
2	75	West.	720
1	50	Cr. Wh.	900
2	50	West.	490
1	40	G.E.	720
3	40	West.	900
1	40	G.E.	1750
1	35	G.E.	950
1	30	G.E.	680
1	30	West.	850
1	25	West.	1150
1	20	G.E.	1150
2	20	Delco	1200
2	15	West.	1800
1	7½	West.	1150
1	5	West.	1150

ENGINE GENERATOR SETS

10—NEW 1 kw 14.25 v. D.C. and 2 kw. 28.5 v. D.C. Homelite portable gas eng. Gen. sets. Can furnish lamps and batteries. Suitable for farms and camps.

3—5 kva. 120/240 v. 1 ph. 60 cy. Witte Diesel.

1—10 kw., 115 v. D.C. 1200 rpm., Hercules DIESEL.

30—NEW 25 kva. West. 120/208 v. 1 and 3 ph. 60 cy. LeRoi GAS.

1—35 kva. 220/440 v. 3 ph. 60 cy. 257 rpm., Ridgway STEAM.

12—100 kw., 240/120 v. Delco 1200 rpm., dir. driven by 150 HP. Superior GBD-8 5½"x7" 8 cyl. DIESEL.

1—125 kva. G.E. 220/440 v. 3 ph. 60 cy., dir. con. Skinner UNIFLOW Engine.

HOISTS or WINCHES

200—1½-ton Hand Cranked ratio 27.1 thru an enclosed double reduction gear unit with 4 planetary gears mounted on steel plate complete with 48' of ¼" cable, ratchet type brake, push button release.

CAR PULLERS

100—Brand New with ¼" cable, 1½ and 2 ton A.C. or D.C. Motors.

TRANSFORMERS

20—NEW 25 kva. 460 v. pri. 230/115 v. sec. 1 ph. 60 cy. Allis-Chalmers.

SPECIAL BARGAIN AIR COMPRESSORS

7—240 CFM Westinghouse type 3 VS-23 3 cyl. vert., 150 lbs. pres. dir. con. to 50 HP., 220/440 or 2200 v. 3 ph. 60 cy. West. Slip Ring Motors, auto. Control. Can furnish D.C. Motors or Oil or Gasoline Engines if desired.

DUQUESNE ELECTRIC & MFG. CO., PITTSBURGH (6), PA.

Montrose — 5800

FOR SALE

CRUSHERS

1—Link Belt 36 x 60 double roll crusher, equipped with gear drive.

1—American Pulverizer crusher, No. 1627. Type AC, machine number AC3B, crushes from 20" down to ½".

1—Jeffrey single roll crusher, size 36 x 36. No. 4507. Will crush maximum lump of 20" at rate of 250 tph to a product of 1¼" when operating at 300 rpm. Direct connected by flexible coupling to 75 HP., GE motor., 3/60/440, speed full load 885, ball bearing, fan cooled.

1—McNally Pittsburg 30 x 54 single roll crusher.

MOTOR GENERATOR SETS

1—50 KW motor generator set, consisting of: 75 HP. Crocker Wheeler DC motor, compound wound, No. 254053, 230 volts, 273 amps, type CCM, size 50H, connected to 75 HP. Westinghouse AC motor, 220 volts, 1,170 RPM, 3 phase, 60 cycle, 166 amps, type CS, No. 1504169, complete with compensator for AC end, but no switchboard for DC end.

1—50 KW motor generator set, AC end 2,200 volts, DC end 250 volts, complete with compensator. Perfect condition.

TIPPLES

1—Steel tipple complete with shaker and concrete silos. Capacity 1,000 tons per day.

PUMPS

All sizes and types of pumps.

MINING MACHINES

2—Sullivan type CH8, AC longwall mining machines, 3 phase, 60 cycle, 220 volt, 30" cutter bars, complete with 300' each of 3 conductor mining machine cable.

2—Goodman, Universal mining machines, type 112-G3, 36" gauge.

1—Jeffrey 35BB, AC shortwall mining machine, 6' cutter bar, complete with tip turn truck, cable and reel.

1—Goodman Universal mining machine, 112AA, 42" gauge, 250 volts, DC, 8' cutter bar.

1—Sullivan 7B AC shortwall mining machine, 3 phase, 60 cycle, 220 volts.

1—Sullivan CLE 5 Longwall mining machine, 220 v. AC.

HOISTS

1—Ottumwa Iron Works single rigid cylindro-conical drum hoist, serial number 4080, complete with remote control and hydraulic brakes, constructed for following hoisting conditions: Weight of cage, 6,000 lbs., weight of car, 1,600 lbs., weight of coal average 2,500 lbs., total cage travel 277 ft. (HMD) size of rope 1¼", trips per hour 78, rest period 15 sec. Balanced hoisting without slack rope, end lift. Post brake 72" diameter, 8" face. Direct connected to Western Electric 150 HP motor, 3 phase, 60 cycle, 440 volts, slip ring speed full load 700 RPM, complete with automatic switchboard.

1—Ottumwa Iron Works single friction drum hoist, serial number 3846 driven by double reduction gears. Built for 7,000 pounds of rope pull with rope speed of 250 ft. per minute. Equipped with a drum 48" diameter, 26" face not grooved, 60" diameter band brake, 48" diameter Lane type band friction clutch. Drum shaft 5 7/16" diameter, intermediate shaft is 4 15/16" diameter. High speed pinion is mounted on the motor shaft. Complete with 100 HP GE motor #628725, type 1-12-100A-600, form M, 3 phase, 60 cycle, 220 volts, 255 amps, speed no load 600, speed full load 570, equipped with controller and resistance.

1—Ottumwa Iron Works Hoist, serial number 3561. Drum is 48" diameter, 36" face grooved for 1" rope. Equipped with a post brake 54" diameter, hand operated. Has single reduction cut spur gears, 19 teeth and 196 teeth 1¼" pitch, 10" face. Drum shaft 7" diameter. Drum shaft bearings 7" x 14" pinion shaft bearings 4½" x 15" of the ring oiling type. Built for the following hoisting conditions: weight of car 900 lbs., weight of coal 2,500 lbs., weight of cage 3,000 lbs., cage travel 250 feet, rope speed 700 ft. per minute. Built for balanced hoisting single rigid drum type, driven by single reduction gears, pinions being connected to the drum by a flexible coupling. Direct connected to 100 HP Westinghouse motor, type CW, 220 volts, 3 phase, 60 cycle, 360.8 amps to 580 RPM, #2394853 equipped with controller and resistance.

TRANSFORMERS

3—GE 25 KVA transformers, 2300/4000—220/440, type H, form K.

3—GE 15 KVA transformers, 2300/4000—220/440, type H, form N.

2—GE 5 KVA transformers 2300/4000—110/220.

All of the above transformers with steel shells, late type.

1—GE 100 KW syn. converter, type TCC-6-100-1200, form P, 60 cycle, 1,200 RPM, 275 volts, DC 364 Nom. amps, serial #3889193, with 3 G.E. transformers, for K, type R.R. 60 cycle, 40 KVA, volts 2070/2300, complete with switchboard.

We are distributors for John A. Roebling's Sons Company wire rope and fittings.

GAVENDA BROTHERS, Inc.

CANTON, ILLINOIS

SEARCHLIGHT SECTION

250 VOLT BALL-BEARING LOCOMOTIVES

4—8-ton Goodman, Type 32-A-1-4-T.
4—6-ton Westinghouse, Type 905-L.
5—6-ton General Electric, Type HM-801.
3—8-ton General Electric, Type HM-819.
2—8-ton General Electric, Type HM-707.
4—8-ton General Electric, Type HM-839.

The above Locomotives are from 36" to 48" gauge. All are equipped with CY-21 motor-driven gathering reels and 500' of practically new cable. All are rebuilt. Can make immediate shipment.

600 END-DUMP 3½-TON STEEL MINE CARS

Height overall—46".
Length of body—9'.
Overall length—10'2".
18" Timken roller bearing wheels.
Wheel base—36".
Width—64".
Axles—3".
Steel bodies—3/16".
Drawbar—1" x 4".
Oak bottoms—3¾".
3—Ling couplings.
3—Binders.
Spring draw head one end
Track gauge—42".

AC CUTTING MACHINES

5—Goodman Universal 112-G3, 3 phase, 60 cycle, 220/440 volt, on self-propelled tracks.

LATE TYPE GATHERING REELS

5—Practically new General Electric motor-driven Gathering Reels, Type MVR-42-F5, Reel Motor Type 301-E2 with 500' of practically new cable.
3—CY-21 motor-driven Reels with 500' of cable.

250 VOLT COAL CUTTING MACHINES

3—New Jeffrey 29-L Low Vein Type Track Cutters, 30" tramming height.
6—Jeffrey 35-BB Machines, just taken out of service.

AC LOADING MACHINES

3—8-BU Joy Loading Machines on cats, 42" gauge.
6—7-BU Joy Loading Machines on cats, 42" gauge.

ELECTRIC HOIST

1—1650 HP Shaft or Skip Hoist, Fly Wheel Set, 7' small diameter by 11' large diameter, cylindro-conical drum, 300' 1½" rope capacity, practically new unit. Complete specifications on request.

Frank J. Wolfe

We Specialize in Buying Complete Mines That Are Going Out of Business Or From Receivers in Bankruptcy, Administrators of Estates, Etc.

COAL MINE EQUIPMENT SALES CO.

306-307 BEASLEY BUILDING — TERRE HAUTE, INDIANA

AIR COMPRESSORS:
12—Belted 360, 676, 870, 1,000, 1,300 ft.
12—Diesel 105, 315, 520, 676 & 1,000 ft.
6—Electric 1,300, 1,500, 2,200, 5,000 ft.

CARS & LOCOMOTIVES:
65-Ton G. E. Diesel Elec. Locomotive.
100—50-ton cap. Gondolas.
35—50-ton cap. Flat Cars.
8—100-ton, 45-ton, 30-ton Diesel Locomotives.
6—10, 16, 20 & 30 ton Gas Locomotives.
150—8,000 & 10,000 gal. cap. Tank Cars.
20—12-yd. Std. ga. Steel Dump Cars.
1—50-ton G.E. Diesel Elec. Locomotive.

RUBBER CONVEYOR BELTS:
1,000', 60', 600', 30", 300', 20", 1,000', 42", 900' 48", 1450', 36", 1,200', 24", 900', 18", 600', 16", 350', 14".

ELECTRIC LOCOMOTIVES:
15—3, 5, 8 ton Battery & Trolley.

DIESEL GENERATORS:
12—100, 150, 180 & 480 K.W.

MINE LOADERS:
17—GD9, Elmco 21, Conway 20, 50, 60 & 75 and Sullivan HL3.

STEEL TANKS:
6—50,000 and 100,000 gal. Tanks on tower.
30—8,000, 10,000 and 20,000 gallon capacity.

SHOVELS—DRAGLINES:
7—1-yd. 1½- and 2-yd. Gas & Diesels.
16-yd. Elec. 160 ft. Boom Dragline.

R. C. STANHOPE, INC.
60 E. 42nd Street — New York 17, N. Y.

VIBRATING SCREENS CRUSHERS — SCALES

IMMEDIATE SHIPMENT

3' x 6'—1 deck Vibrat. Screen	$648.00
3' x 6'—2 deck Vibrat. Screen	780.00
3' x 8'—1 deck Vibrat. Screen	768.00
3' x 8'—2 deck Vibrat. Screen	900.00
3' x 8'—3 deck Vibrat. Screen	1164.00
Stoker Coal Crusher	474.00
Large Coal Crusher	1074.00
Coal Crusher with capacities to 215 T.P.H.	3540.00
15 Ton Truck Scale	450.00
20 Ton Truck Scale	510.00
5 Ton Tipple Scale	312.00

Many types of conveyors.

CONSULT OUR ENGINEERS AND GEOLOGISTS WITHOUT OBLIGATION

BONDED SCALE COMPANY
2190 S. Third St., Columbus 7, Ohio
Phone GA 5712 — UN 2832 Evenings

Visit our factory. We manufacture more than 150 models of Scales, Screens, Crushers, and Conveyors. Inspect several models in operation.

SUBSTATIONS

4—150 kw General Electric Synchronous Motor-Generator Sets, complete, 275 volts or 250-300 volts DC—2,300/4,000 volts AC, 3 phase, 60 cycle; 1,200 rpm. Type ATI Motor; Type MPC Generator.
2—200 kw, 1,200 rpm., 250 volt DC, pedestal type G. E. Rotary Converters, with transformers and switchboards.
Also motors, transformers & control.

R. H. BENNEY EQUIPMENT CO.
5024 Montgomery Road
Norwood 12, Ohio

LOCOMOTIVES

80 TON WHITCOMB DIESEL ELEC.
2—64 TON WHITCOMB DIESEL ELEC.
2—65 TON WHITCOMB DIESEL ELEC.
16 TON VULCAN GASOLINE.
DARIEN CORP., 60 EAST 42nd ST., N.Y. 17, N.Y.

Electrical Equipment

Converters, Motor Generator Sets, A.C. and D.C. Motors, Control Equipment and Transformers.

We build equipment to fit your requirements. Over 25 years engineering background.

C. B. LOCKE CO.
P.O. BOX 3227
TEL. 38-136
CHARLESTON, W. VA.

NEW and REBUILT

MOTORS

150 HP, 900 RPM, Elec. Mach., 220/3/60, Syn.
80 HP, 1,200 RPM, Cr. Wh. 220/440/3/60, Ind.
75 HP, 900 RPM, Elec. Mach., 220/3/60, Syn.
75 HP, 1,800 RPM, U. S., 220/440/3/60, Ind.
65 HP, 1,200 RPM, GE., 220/440/3/60, Ind.
30 HP, 1,200 RPM, GE., 220/3/60, Slip Ring
5, 7½, 10 and 15 HP, new and used, TEFC and open.

(5) 5 HP, 2,200 RPM, Reliance, Ex. Pr., 230 V, DC.
Several Whse. type SK, 230 V, DC.

GENERATORS

100 KW, 1,400 RPM, Whse. SK, 250 V, DC.
100 KW, 2,000 RPM, Whse. SK, 250 V, DC.

STRIPPING & MINING EQUIPMENT

Coal Crushers • Vibrating Screens
Conveyors • Electric Coal Drills
Electric Generator Sets • Mine Fans

THE INDUSTRIAL EQUIPMENT CORP.
(Established 1902)
910 First National Bank Bldg.
Pittsburgh 22, Pa.
Warehouse: Carnegie, Pa.

PIPE — MACHINERY — GAS ENGINES
AIR COMPRESSORS — DIESELS — PUMPS

Some Steam Engines and Boilers available only slightly above the metal price

BRADFORD SUPPLY COMPANY
WAYNE, WOOD COUNTY, OHIO — **Near Toledo**

WESTINGHOUSE

TYPE SK—MOTORS

WIRE INQUIRIES COLLECT

IRON and STEEL PIPE

New and Used

Large stocks, all sizes
attractive prices

L. B. FOSTER COMPANY
P. O. Box 1647 — Pittsburgh 30, Pa.

For Sale

25,000 feet 4" ID Redwood Pipe, 8' and 12' lengths.
Prices on request — Immediate shipment.
Indiana, Pa. —or— Phone 1964
KOVALCHICK SALVAGE CO.

M. K. FRANK, 810 Park Bldg., Pittsburgh, Pa. Gran. 4768

MOTORS, GENERATORS, TRANSFORMERS

1 — 1500 H.P.
Bought and Sold
New and Rebuilt

ELECTRIC EQUIPMENT CO.
Rochester 1, N. Y.

CRANES-MOTORS and ELECTRICAL EQUIPMENT

ENGINEERED AND REBUILT BY SPECIALISTS IN OUR MODERN PLANT

SQUIRREL CAGE MOTORS
3-PHASE, 60-CYCLE

Qu.	HP.	Make	Type	Volts	RPM
1	20	G.E.	1-K	220	565
1	20	Whse.	CS	550	1740
2	25	G.E.	KT-332	220	865
1	25	G.E.	1-K	550	900
1	30	Whse.	CS	550	900
1	40	G.E.	1-K	440	900
1	40	F.M.	H-12-D	220	860
2	40	Al.-Ch.	AR	440	860
1	50	G.E.	1-K	440	695
3	50	Whse.	CS	440	690
1	50	F.M.	H-16-A	440	900
1	50	Al.-Ch.	AR-220D	440	1155
1	50	Ideal	AT-445	440	1750
1	60	Whse.	CS-607	440	800
1	75	Whse.	CS	440	1750
1	75	Al.-Ch.	AR	2300	1765
4	100	F.M.	HS	440	880
2	100	G.E.	KT-556	2200	865
1	100	Whse.	CS-760	2300	1170
1	100	G.E.	K-544	2300	1175
1	100	Al.-Ch.	AR	2200	1100
1	100	G.E.	IK	440	1800
2	125	Al.-Ch.	AR	440	435
2	125	C.W.	126Q	440	430
1	125	Whse.	CS-761	440	1750
2	125	Al.-Ch.	AR	2200	1750
1	150	G.E.	IK	440	690
1	150	El. Mchy.	B.B.	220	1200
1	250	Whse.	CS	2200	1160
2	500	Whse.	CS	6600	514

SLIP RING MOTORS—CONSTANT DUTY
3-PHASE, 60-CYCLE

Qu.	HP.	Make	Type	Volts	RPM
2	5	Al.-Ch.	ARY	440	680
1	7½	G.E.	MT	550	870
1	10	Howell		440	600
1	15	G.E.	MT-322	440	845
1	15	Whse.	HF	440	1150
2	15	G.E.	I-M	220	1125
1	20	G.E.	MT-326	220	850
4	25	G.E.	MT-526	440	840
1	25	G.E.	MT-332	2200	850
1	25	Al.-Ch.	ARY	2200	860
2	25	Whse.	CW-4810	220	1750
1	30	Whse.	CW	440	1160
1	40	Al.-Ch.	ARY	2200	435
3	40	G.E.	MT-346	550	560
3*	40	G.E.	I-M	600	1170
1	50	Al.-Ch.	ARY	2200	490
2	50	G.E.	MT-536	2200	1150
1	75	G.E.	MT-548	440	1200
1	125	Al.-Ch.	ARY	440	900
1	150	G.E.	I-M	2200	1750
1	250	Whse.	CW-1106	2200	580
1	300	Al.-Ch.	ARY	2200	505
1	300	G.E.	I-M	2200	1200
1	400	G.E.	I-M	2300	875
1*	600	G.E.	MT-412Y	2200	720
1*	750	G.E.	MT-414Y	2200	726
1*	1200	Whse.	CW	2200	590

*40-Cy. *Mill Type 2-Pedestal bearing on cast iron base, complete with REVERSING PRIMARY and MAGNETIC SECONDARY ENGINEERED for your requirements.

SYNCHRONOUS MOTORS
3-PHASE, 60-CYCLE

Qu.	HP.	Make	P.F.	Volts	RPM.
2	50	G.E.	.8	2200	600
1	60	G.E.	.8	440	1200
2	100	G.E.	.8	440	600
1	100	Ideal	.8	220	900
1	150	G.E.	1.0	2300	900
1	200	Al.-Ch.	1.0	2300	360
1	885	G.E.	1.0	11400/6600	514

MOTOR GENERATOR SETS

Qu.	KW.	Make	RPM.	Volts D.C.	Volts AC.
1	5½	G.E.	1800	250	220/440
1	9	G.E.	1800	250	220/440
7	25	Whse.	1200	120/240	220/440
3	50	Whse.	1200	120/240	440/2300
2	35	G.E.	1800	125	220/440
1	50	LO.AL.	1200	120/240	440/2200
1	75	Whse.	1200	125	220/440
1	75	Al.-Ch.	900	250	220/440
1	100	Al.-Ch.	900	125/250	2200
1	100	G.E.	1200	250	440/2300
1	100	C.W.	1200	250	440/2300
3	150	C.W.	1200	300	440/2300
1	200	G.E.	1200	250	4150/2200
1	400	Whse.	720	550	2300
2	1000	G.E.	514	600	4150/2300

G.E. Rotary Converter 2025/2565 K.W. 225/285 V.D.C. 450 RPM complete with A.C. & D.C. panels and control, 2,760KVA transformer O.I.S.C. 6900-V, 3-Ph., 60-Cy. This equipment can be seen on original foundation and under power.

TRANSFORMERS (OIL-COOLED)

Qu.	K.V.A.	Make	Voltage	Ph.	Cy.
2	10	Whse.	2400/ 480/ 240	1	60
2*	13	Kuhlman	480/ 240	1	60
1	25	Al.-Ch.	2500/ 460/ 230	1	60
1	30	G.E.	2200/ 1100/ 608	1	60
3*	37½	Whse.	460/ 230/ 230/ 115	1	60
2	50	Wagner	13200/11880/ 575/ 287	1	60
3	50	Al.-Ch.	22000/ 220	1	60
14	100	G.E.	1160/ 2300/ 120/ 240	1	60
3	130	G.E.	19000/ 9500/ 550/ 2200	1	60
3	150	Wagner	8800/ 4400/ 2300	1	60
3	165	G.E.	11000/22000/38100/ 430/ 215	1	60
3	667	G.E.	2300/ 4000/ 460	1	60

T. B. MAC CABE COMPANY.

4314 CLARISSA STREET — PHILADELPHIA, PENNA.

BARGAIN — FOR SALE

100 KW. DIESEL ENGINE GENERATOR SETS

11—100 KW., 250/275 V. D.C. Delco Generators dir. con. to 150 HP., Model GBD-8, 5½x7, 8 cyl. Superior Diesel Engines, elec. starting with muffler, power panel and accessories.

Practically as good as new — Only Used for Spares.

DUQUESNE ELECTRIC & MFG. CO.
Pittsburgh 6, Pa.

AVAILABLE IN STOCK—EXCELLENT QUALITY

RELAYING RAILS AND ANGLE BARS

AS FOLLOWS:

500 TONS 60 LB ASCE RAIL
200 TONS 75 LB ASCE RAIL
500 TONS 85 LB ASCE RAIL

For Prices and More Detailed Information Contact

COMMERCIAL METALS CO. — **Dallas, Texas**

FOR SALE:

1—**NEW CONVEYOR BELT**
Goodrich Super Long Life cord, 42" wide
1 Pc. — 1014 Ft.
1 Pc. — 1017 Ft.
1 Pc. — 268 Ft.
Six-ply, 42-oz. duck, 7/32 top cover, 1/16 bottom cover.
ALL NEW NATURAL RUBBER.

2—**COMPRESSOR**
Ingersoll-Rand PRE-2
800 H.P. 3 Phase, 60 Cycle, 2,200 Volt synchronous motor direct connected, complete.

A. J. O'NEILL
Lansdowne Theatre Bldg.
LANSDOWNE, PA.
Phila. Phones: Madison 8300 - 8301

EVERYTHING FOR THE TRACK FROM
SWITCH TO BUMPER

300 TONS
40# NEW RAIL
DOUBLE DUTY FORTIES
20#-25#-30#-35# and 40#
SWITCHES & COMPLETE TURNOUTS

MORRISON
RAILWAY SUPPLY CORP.

RAND BLDG., BUFFALO 3, N. Y.
EMPIRE BLDG., BIRMINGHAM 3, ALA.
CONTINENTAL OIL BLDG., DENVER 2, COLO.

RAILS

NEW AND RELAYING
Track Accessories
• Prompt Shipments
• Fabricating Facilities
• Trackage Specialists

From 5 Warehouses

L. B. FOSTER CO.
NEW YORK CHICAGO HOUSTON
PITTSBURGH SAN FRANCISCO

ADDRESS THE FOSTER OFFICE NEAREST YOU!

NEW SPARE PARTS FOR
Joy T-2-5 Caterpillar Coal Mining Machines.
Ingersoll-Rand Air Compressors—150 HP—4XVG-2 and 300 HP—8XVG-1.
Worthington Pump and Motors. Type IA-4, single stage, double suction.
All parts new, in good condition and can be purchased at considerable savings. Write for detailed lists.

MANUFACTURERS EQUIPMENT CO.
1678 E. 18th St. — Cleveland, Ohio

RAILS — CARS

All sections of rails and good serviceable second hand cars, all gauges, also spikes, bolts, frogs, switches and ties.

M. K. FRANK

480 Lexington Ave. New York, N. Y.
Reno, Nevada

810 Park Bldg., Fifth Ave. Pittsburgh 22, Pa.
Carnegie, Pa.

RELAYING RAIL

TRACK ACCESSORIES

MIDWEST STEEL CORP.
Gen. Off.: CHARLESTON 21, W. VA.
Warehouses
CHARLESTON, VA.
KNOXVILLE, TENN. • PORTSMOUTH, VA.

SHOVELS - DRAGLINES - DRILLS - TRACTORS

621-S Page 135' boom, 6 yard, 2 engine diesel dragline. Very good condition.

Model 120-B Bucyrus-Erie Electric Shovel. 4 yard dipper, 60 cycle electric. Machine has been recently rewired, and truck and crawlers have been rebuilt. Located near Hazelton, Pa.

Model 120-B Bucyrus-Erie Electric Dragline. 110' boom, 4 yard bucket; 3 phase, 60 cycles, 2300 volts. Machine is in excellent condition. Located in Virginia.

Marion Model 125 Electric Dragline. 100' boom, 3 yard bucket. Good condition.

1201 Lima Dragline. 80' boom, 3 yard bucket. Waukesha-Hesselman diesel engine. Fine condition. Near Hazelton, Pa.

Model 595 Link-Belt Diesel Dragline. 85' boom, 2½ yard bucket; 2 years old, located in West Virginia.

Model 54-B Bucyrus-Erie 2½ yard Shovel. Buda diesel engine. Excellent condition. Near Hazelton, Pa.

Model 1001 Lima Dragline. 80' boom, 2½ yard bucket. Hesselman engine. Near Hazelton, Pa.

Bucyrus-Erie 44-B 2 yard Shovel. Buda diesel engine. Excellent condition. Located New York State.

Bucyrus-Erie 37-B 1½ yard Shovel. D-13000 Caterpiller engine. Excellent condition. Located New York State.

362 Marion Combination with 1½ yard dipper, 60' boom, D-13000 Caterpillar engine and light plant. Late 1946 model. Located near Hazelton, Pa.

Model L-55 Lorain 1 yard Shovel. Waukesha-Hesselman gas engine. Completely overhauled.

¾ Yard Buckeye Shovel. G.M.C. diesel engine. New.

42T Bucyrus-Erie Blast Hole Drill with Caterpillar diesel engine, tools for 9" holes.

Model 44 Loomis Clipper Blast Hole Drills. Full Crawlers. Tools for 6" holes.

Parmanco Vertical Auger Drill. Mounted on Dodge power wagon, 2 speed power feed; 60' 6" augers.

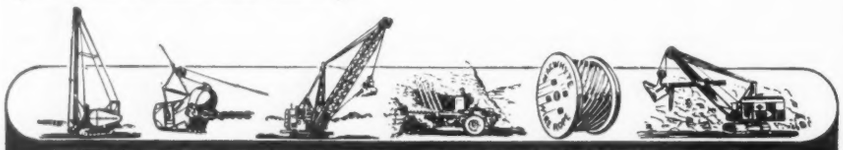
D-4 Caterpillar Tractors with Bulldozer blades.

D-7 Caterpillar Bulldozer and Angledozers. Rebuilt.

D-8 Caterpillar Tractor, Ser. No. 8R-4990 with bulldozer blade and DDPCU.

TD-9 International Caterpillar Tractor with Hydraulic angledozer blade.

We carry in stock Page Automatic Dragline Buckets. We may have the size you need for immediate delivery.



FRANK SWABB EQUIPMENT CO.
Hazleton National Bank Bldg., Hazleton, Penna. Phone 2-4931

Telephone 4910

Wagner
"CERTIFIED REBUILT"

M-G SETS—AC to DC
500 KW G.E. DC 250 V., synch. motor 440 V.
150 KW Cr. Wh. DC 250 V., synch. motor 440 V.
100 KW Whse. rotary converter, 250 V. DC output.
80 KW Star DC 250 V., synch. motor 440 V.

D.C. MOTORS—230/250 V.
150 HP Cr. Wh. b.b. TEFC 890 RPM.
100 HP Whse. SK 181 450/900 RPM.
60 HP Allis-Ch. b.b. 520/690 RPM, New (2).
50 HP G.E. CD 123 850 RPM.
40 HP Whse. SK110L 1700 RPM.
40 HP Whse. SK133 850 RPM.
30 HP Whse. SK 160 350/1050 RPM.
25 HP Whse. SK 1100 RPM.
15 HP Whse. SK 850 RPM (5).

Complete Stock A.C. Motors—New and Rebuilt Up to 500 H.P.—Sq. Cage, Slip Ring, Synch.
SPECIAL—600 H.P. G.E. slipring motor 360 RPM, 3/60/440 V.
Gear Head Motors Speed Reducers Pumps—Blowers
WRITE — WIRE — PHONE

ARTHUR WAGNER CO.
1433 W. Randolph St. Chicago 7
ELECTRIC MOTORS · GENERATORS

FOR SALE
100 KW
DIESEL GENERATORS

DIRECT CURRENT
260/340 VOLTS—G.E. COMPOUND WOUND GENERATOR
150 H.P. GENERAL MOTORS DIESEL MODEL 3-268A—1200 R.P.M.
COMPLETE WITH SWITCHBOARD, CONTROL PANELS, ETC.
SLIGHTLY USED—EXCELLENT CONDITION

CERTIFIED MATERIALS SUPPLY, INC.
534 W. 12th Newport, Ky.
COlonial 5139

REBUILT MINING MACHINES
4—112 A A. Goodman Universal D.C.
1—112 G 3 A. Goodman Universal, 220 volts A.C.
4—C.E-7 Sullivan A.C. and D.C.
1—7-B Sullivan D.C., 250 volts.

LOCOMOTIVES
2—6-ton Goodman type 33 Ball Bearing.
1—8-ton Goodman type 32 Ball Bearing.
1—6-ton G. E. 42-inch gauge.
1—5-ton Mancha Storage Battery Locomotive.
42-inch Track Gauge, height 40", complete with Storage Batteries and Charging Panel.

LOADING MACHINES
2—8 B. U. Joy, 42-inch gauge on cats.
3—5 B. U. Joy, 42-inch gauge on cats.

THOMAS GILLESPIE & SONS
State Rd. 67 — Bicknell, Ind.
Phones 179 and 149 L. and 149 K.

COAL CUTTING MACHINES
1—35B Jeffrey Shortwall, 250 V, D.C.
1—35BB Jeffrey Shortwall, A.C.
1—29C Jeffrey Arcwall, 250 V, D.C.
1—124 E. J. Goodman Slabbing, 250 V, D.C.

LOCOMOTIVES
1—25-ton GE Haulage Locomotive.
1—20-ton GE Haulage Locomotive, 250 V, D.C.
1—13-ton West., bar steel frame.
1—10-ton West., bar steel frame, 250 V, 907C motors.
1—8-ton GE HM839, 500 V motors.
2—6-ton GE steel frames, HM823, 250 V motors.

M. G. SETS
1—200 KW, Allis-Chalmers, rotary converter, 250 V, D.C. with 2,300 V transformers.
1—60 KW, 250 V, D.C. with 100 HP, Synchronous motor.

TIPPINS MACHINERY CO.
PITTSBURGH 6, PA.

Bargain in Mining Equipment
100 kw 250 volts D.C.-Gen direct conn. to Thompson 8 cyl. diesel with sw. board.
115 H.P. Gen. Motors diesel with vee pulleys and clutch.
1,000 ft. practically new trolley wire and hangers.
Goodman 250 v. 4-ton low vein Mine Locomotive—25" high—with reel. Trolley type inside frame.
G.E. 7-ton Trolley Loco., 250 v., inside frame.
Westinghouse 5-ton, outside frame.
2—Jeffrey 4-ton, inside frame.
Std. Goodman D.C. Coal Cutter—6½ ft. bar—300 ft. cable.
Sullivan B D.C. Cutter.
Sullivan CE-9—D.C., 6½ ft. bar.
D.C. 250-volt Motors, 2 to 25 H.P.
2—572 CP Coal Drills.
1—472.
48" aluminum blade propeller type Mine Fan—ball-bearing.
20 to 150 H.P., 2,200 volts, 3 phase Motors.

EMERSON ELECTRIC CO.
711 N. 9th St. Birmingham 4, Ala.

STRIPPING EQUIPMENT FOR SALE

1 Page Dragline #621 S; 7-yd. bucket, 4 years old, good as new.

PENOWA COAL COMPANY
2617 Grant Building Pittsburgh 19, Pa.

FOR SALE
All Bronze Centrifugal Pumps:
1—Hazelton 8", 3 stage, 1,300 GPM, 325 Head, 150 HP.
1—Hazelton 10", 3 stage, 2,000 GPM, 300 Head, 200 HP.
1—Hazelton 6", 3 stage, 1,000 GPM, 300 Head, 100 HP.
1—Hazelton 6", 2 stage, 1,200 GPM, 320 Head, 125 HP.
2—Hazelton, 4", 4 stage, 600 GPM, 300 Head, 75 HP.
1—DeLaval, C.I. Bronze Impeller, 400 GPM, 250'.
1—DeLaval, C.I. Bronze Impeller, 1,000 GPM, 160'.
All rebuilt. Motors 2200/440/220/550.
Motors, hoists, transformers, MG sets and other items available.

E. P. DIETRICK
Phone 3-7357 Scranton 9, Pa. 829 Richmont St.

FOR SALE
MINE CARS

15 Sanford-Day all-steel drop bottom 42" gauge ballbearing. Approximately 12'x6'2"x2'2" cap. 4 ton crowned, first class. Sold subject to inspection.

BRUCE PRATER
Pikesville, Ky.

Strip Miners Attention . . .

GO ANYWHERE • LIFT MORE • REASONABLY PRICED

This multi-purpose unit will prove itself in rough, muddy or mountainous terrain.

•

Its sturdy construction can be used best as follows:

Mobile unit for prospect drill.

Mechanic's and welder's field-service repair truck with front A-frame.

Air compressor mounting.

Pole setter mounted by A-frame on front, Dirt auger on rear.

Dump-body use for refuse disposal.

Mounting for 5th whel to pull up to 20-ton trailer.

Base for ¼ or .4 cu. yd. dragline.

Made by White Truck Co. for U. S. Army.

White 160 AX Motor (5 ton).

Rubber tracks, can be licensed for use on highways.

Mounting for 5th wheel to pull up to 20-

With or without 10,000 lb. pull front-mounted winch.

Four-speed transmission with high and low range.

Weight appr. 12,000 lbs.

•

Replacement Parts— We have a large quantity of all parts, which will be available for years to come. Your inspection of our parts supply is invited.

•

We guarantee delivery of units in top working condition, and subject to your inspection and trial. Delivery can be made by truck trailer 7 to 10 days from receipt of order. For parts price-list or other information write to

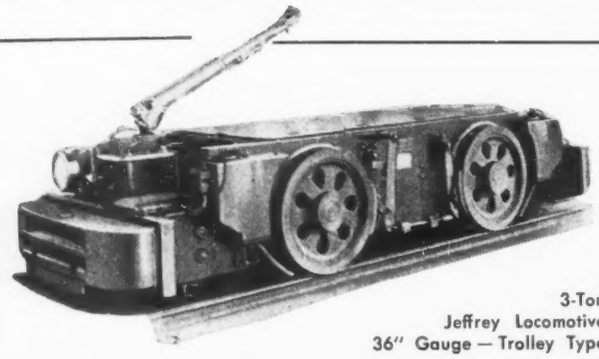
•

CHARLES D. FARR

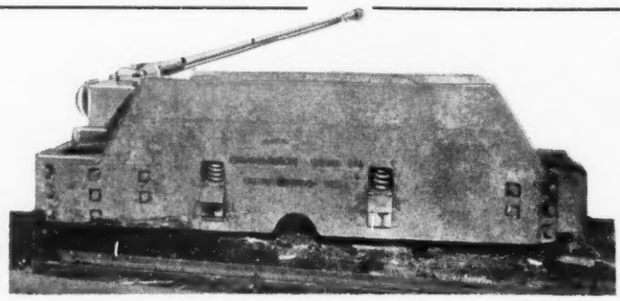
1989 Manilla St., Memphis, Tenn. Ph. 2-0728

COMPLETE LIQUIDATION IMMEDIATE DELIVERY

...New and nearly new coal mining machinery and equipment

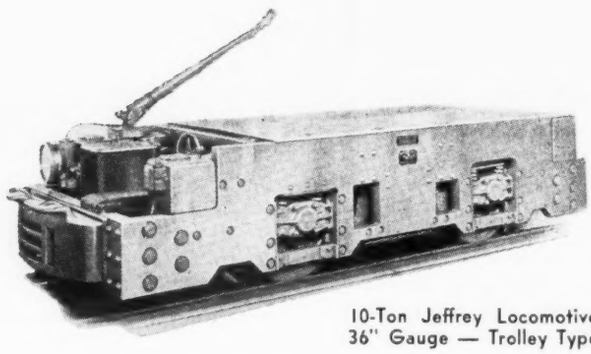


3-Ton
Jeffrey Locomotive
36" Gauge — Trolley Type

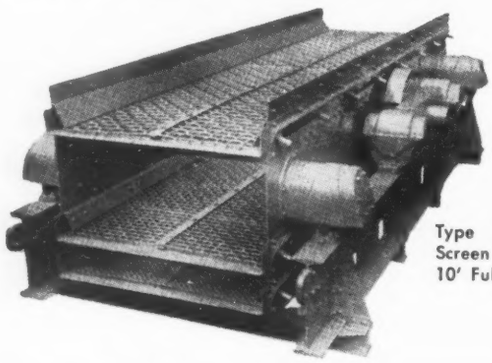


20-Ton Goodman Locomotive Trolley Type — 36" Gauge

6-Ton Jeffrey Locomotive 36" Gauge — Trolley Type



10-Ton Jeffrey Locomotive
36" Gauge — Trolley Type



Type F-600 Ty-Rock
Screen 2—surface 5' x
10' Full Floating.

8-Ton General Electric Trolley
Type Locomotive—36" Gauge

THE COLUMBINE MINE EQUIPMENT CO., INC.

FLAT IRON BUILDING, 1669 BROADWAY **DENVER 2, COLORADO**

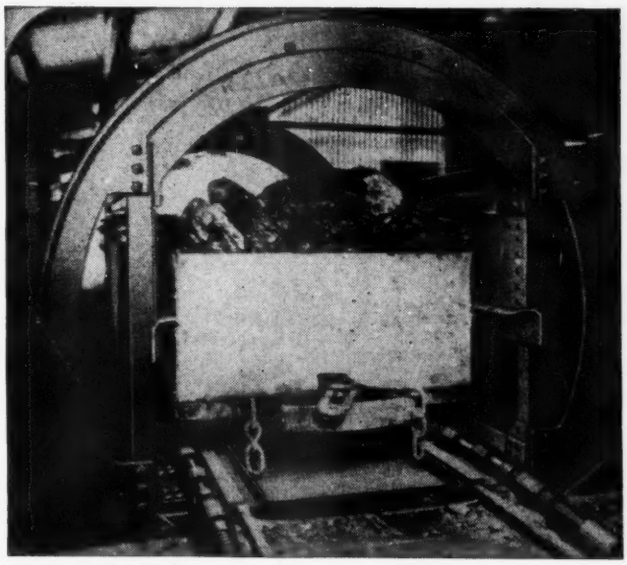
Subsidiary of Portland Equipment Co., 11 Broadway, New York 4, N. Y.

WRITE FOR OUR COMPLETE LIST OF MACHINERY AND EQUIPMENT

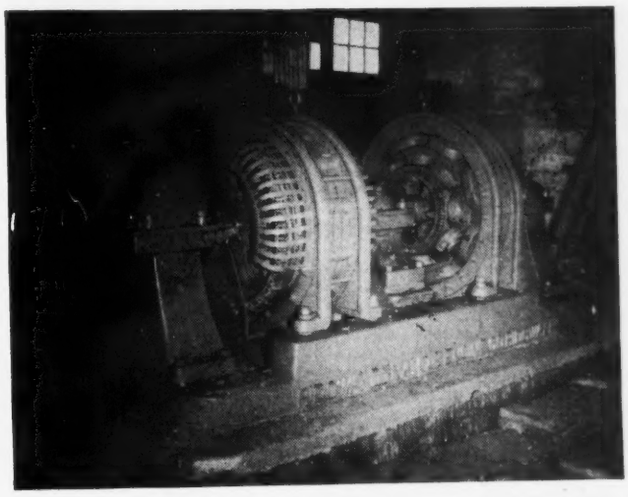
SEE PAGE 209 FOR APPROXIMATE SUMMARY OF HARD-TO-GET OFFERINGS

COMPLETE LIQUIDATION ... New and nearly new coal mining machinery and equipment

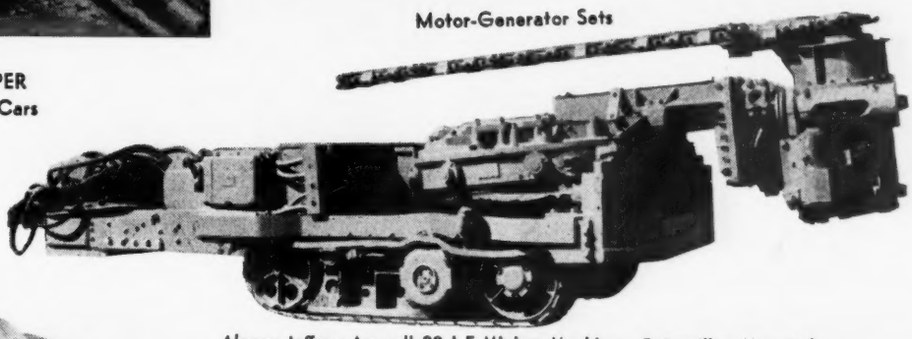
IMMEDIATE DELIVERY



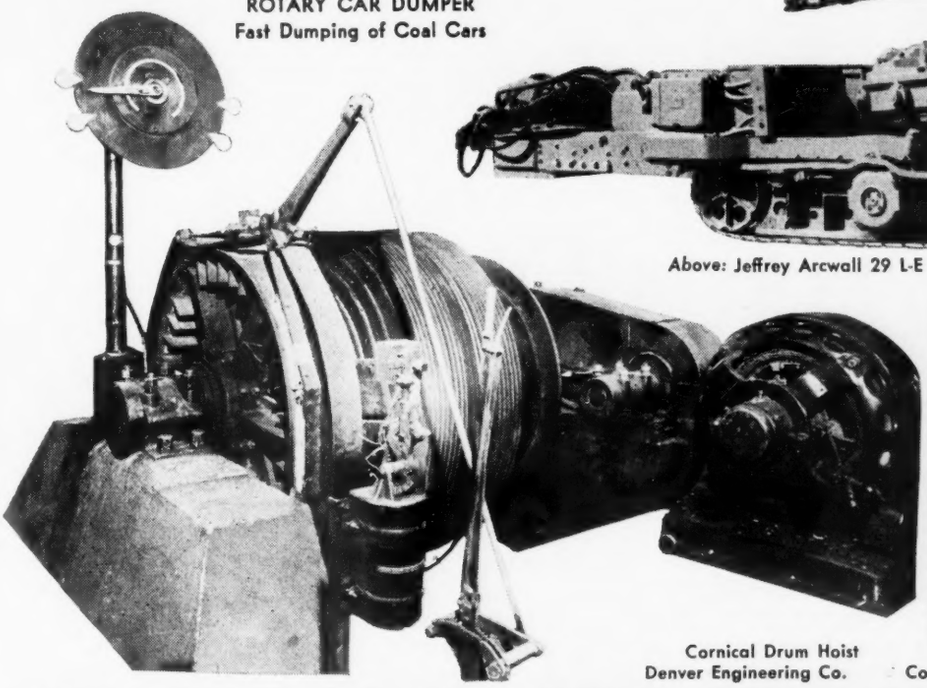
ROTARY CAR DUMPER
Fast Dumping of Coal Cars



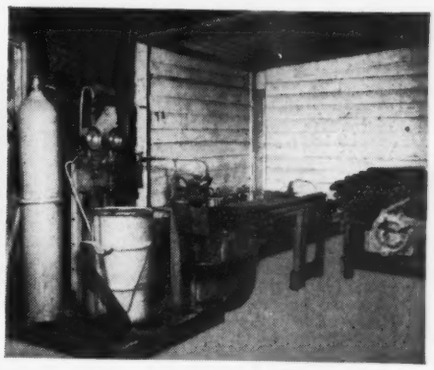
Motor-Generator Sets



Above: Jeffrey Arcwall 29 L-E Mining Machine. Caterpillar Mounted.



Cornical Drum Hoist
Denver Engineering Co.



Complete Cardox Plant — 160 Shell Capacity

THE COLUMBINE MINE EQUIPMENT CO., INC.

FLAT IRON BUILDING, 1669 BROADWAY **DENVER 2, COLORADO**

Subsidiary of Portland Equipment Co., 11 Broadway, New York 4, N. Y.

WRITE FOR OUR COMPLETE LIST OF MACHINERY AND EQUIPMENT

SEE PAGE 209 FOR APPROXIMATE SUMMARY OF HARD-TO-GET OFFERINGS

COAL AGE ADVERTISERS IN THIS ISSUE

An asterisk preceding manufacturer's name indicates detailed information may be found in the 1947-48 MINING CATALOGS

*Acker Drill Co. 162
Air Reduction 67
*Allis-Chalmers Mfg. Co. 8-9, 36A
*Aluminum Co. of America 117
*American Cable Div., American Chain & Cable Co. ..... Third Cover
*American Car & Foundry Co. 155
American Crucible Products 166
*American Cyanamid Co. (Expl. Dept.) 63
American Cyanamid Co. ..... Insert between pp. 136-137
*American Hoist & Derrick Co. 136
*American Mine Door Co. 203
*American Pulverizer Co. 46
*American Steel & Wire Co. 6
Anaconda Wire & Cable Co. 131
Ansul Chemical Co., Fire Extinguisher Div. 148
Arkansas Fuel Oil Co. 66
Armco Steel Corp. 144
Ashland Oil & Refining Co. 189
Atlas Powder Co. 28

Baker-Raulang Co. 192
*Bemis Bro. Bag Co. 164
*Bethlehem Steel Co. 16, 42
*Bird Machine Co. 7
Bituminous Coal Institute 197
Bixby-Zimmer Engrg. Co. 180
Boston Woven Hose & Rubber Co. 43
*Bowdill Co. 136a
Bristol Co. 176

Cambridge Wire Cloth Co. 178, 179
Cardox Corp. 31
*Carnegie-Illinois Steel Corp. 21
Caterpillar Tractor Co. 51
Central Mine Equipment Co. 141
Cheatham Electric Switching Device Co.
Chesapeake & Ohio Railroad 52b
Chicago Perforating Co. 205
*Cincinnati Electrical Tool Co. 203
Cities Service Oil Corp. 66
Coal Operators Casualty Co. 168
*Colorado Fuel & Iron Corp. 201
*Connellsville Mfg. & Mine Supply Co. 174
*Cummins Engine Co. 65

Davidson Co., Cyril 186
Dayton Rubber Co. 127
*Deister Concentrator Co. 138
*Deister Machine Co. 152
*DeLaval Steam Turbine Co. 158
*Detroit Diesel Engine Div., General Motors Corp. 25
*Dings Magnetic Separator Co. 185
Dooley Bros. 201
*Drave Corp. 182
*duPont de Nemours & Co., E. I. (Explosives Dept.) 175
*duPont de Nemours & Co., E. I. (Grasselli Chemicals Dept.) 130

Eaton Mfg. Co. ..... Insert between pp. 52-53
*Edison Storage Battery Div., Thomas A. Edison, Inc. 24
*Electric Steel Foundry 169
*Electric Storage Battery Co. 109
*Ensign-Bickford Co. 72
Eriez Mfg. Co. 139
*Euclid Road Machinery Co. 177

Fairbanks-Morse & Co. 54
*Farmers Engineering Co. 166
Firestone Tire & Rubber Co. 56
Flexible Steel Lacing Co. 198
*Flood City Brass & Electric Co. 203

*Gardner-Denver Co. 36d
Gates Rubber Co. 50
*General Electric Co., Apparatus Dept. 22-23
General Tire & Rubber Co. 125
*Goodall Rubber Co. 142
Goodrich Co., B. F. 1
Goodyear Tire & Rubber Co. 10-11
Gordon Lubricating Co. 47
*Goyne Steam Pump Co. 198
Greensburg Machine Co. 170
Gulf Oil Corp. 163
Gulf Refining Corp. 163
*Guyan Machinery Co. 170

Harnischfeger Corp. 45
Harnischfeger Corp., Welding Div. 154
*Hazard Insulated Wire Works 4
Hewitt Rubber of Buffalo, Div. of Hewitt-Robins, Inc. 53
Heyl & Patterson, Inc. 196
Hough Co., Frank G. 181
Hulburt Oil & Grease Co. 2-3

*I-T-E Circuit Breaker Co. 146
*Independent Pneumatic Tool Co. 184
*Indiana Foundry Co. 202
International Harvester Co. 20
International Salt Co. 190

*Jeffrey Mfg. Co. ..... Insert between pp. 20-21
*Jenkins Bros. 122
Jones & Laughlin Steel Corp. 115, 173
*Joy Mfg. Co. 17, 33, 70-71

*Kennametal, Inc. 133
Kenworth Motor Truck Corp. 187
King Powder Co. 151
*Koppers Co., Inc. 160
Kremser & Sons, Inc., Frank A. 205

*Laughlin Co., Thos. 176
*Leschen & Sons Rope Co., A. 145
*LeTourneau, Inc., R. G. 38-39
Lincoln Engrg. Co. 183
*Link-Belt Co. ..... Fourth Cover
Long Super Mine Car. Co. 165

Mack Trucks 113
Macwhyte Co. 55
*Manhattan Rubber Div. 147
Marion Power Shovel Co. 57
Marlow Pumps 200
McGraw-Hill Book Co. 202, 204
*McLanahan & Stone Corp. 199
McNally-Pittsburg Mfg. Co. ..... Insert between pp. 36-37
*Merrick Scale Co. 180
Michigan Pipe Co. 204
*Mine Safety Appliances Co. 29
*Morris Machine Works 156
*Mosebach Elec. & Supply Co. 168
*Mott Core Drilling Co. 174
*Myers-Whaley Co. 44

Nachod & United States Signal Co. 204
National Electric Products Corp. 157
National Homes Corp. 191
*National Malleable & Steel Castings Co. 68
*Nolan Co. 205
*Norma-Hoffmann Bearings Corp. 62

Ohio Brass Co. 14-15, 129
*Ohio Carbon Co. 180
Ohio Oil Co. 111
Oliver Corp. 149
*Osgood Co. 164

Page Engrg. Co. 48
Paris Mfg. Co. 199
Pennsylvania Drilling Co. 205
Pittsburgh Gear Co. 41
Pittsburgh Knife & Forge Co. 182
Post-Glover Electric Co. 58

Queen City Machine Tool Co. 205

*Ravbestos-Manhattan, Inc., Manhattan Rubber Div. 147
Reliance Elec. & Engrg. Co. 153
Republic Rubber Div., Lee Rubber & Tire Corp. 171
*Roberts & Schaefer Co. 194
Robins Conveyors, Inc., Div. of Hewitt-Robins, Inc. 53
*Rockbestos Products Corp. 64
Robling's Sons Co., John A. 26-27
*Ruberoid Co. 182

S K F Industries, Inc. 195
*Sanford-Day Iron Works, Inc. 52
*Schramm, Inc. 140
*Screen Equipment Co., Inc. 128
Searchlight Section 206-219
*Simplex Wire & Cable Co. 49
Simplicity Engrg. Co. 161
Skookum Co. 186
Snyder & Swanson, Inc. 36
Socony-Vacuum Oil Co., Inc. 121
Standard Oil Co. (Indiana) 18-19
Stearns Magnetic Mfg. Co. 134
Stoody Co. 159
Sun Oil Co. ..... Second Cover
Syntron Co. 185

Tamping Bag Co. 150
Texas Co. 12-13
*Thermoid Rubber Div., Thermoid Co. 35
Tide Water Assoc. Oil Co. 119
*Timken Roller Bearing Co. 69
Tool Steel Gear & Pinion Co. 143
Transcentral Oil Corp. 47

Union Pacific Railroad 40
United States Rubber Co. 137
*United States Steel Subsidiaries 6, 21, 60
United States Steel Supply 60
*Upson-Walton Co. 193

Victualic Co. of America 132

*Walter Motor Truck Co. 32
Walworth Co. 30
*Weir-Kilby Corp. 162
*Western Machinery Co. 167
Westinghouse Air Brake Co. 135
*Westinghouse Electric Corp. 37
Whitney Chain & Mfg. Co. 34
*Wickwire Spencer Steel Div., Colorado Fuel & Iron Works 136d
*Wilfley & Sons, Inc., A. R. 59
*Wilmot Engrg. Co. 61
Wise Co., O. B. 204

■

PROFESSIONAL SERVICES 188

■

SEARCHLIGHT SECTION

(Classified Advertising)

EMPLOYMENT
Positions Vacant 206

SPECIAL SERVICES
Contract Work 206

BUSINESS OPPORTUNITIES
Offered 206

PROPERTY
For Sale 206

EQUIPMENT
(Used or Surplus New)
For Sale 206-219

WANTED
Equipment 206

ADVERTISERS INDEX

Barker Goldman Lubin Co. 206
Benney Equipment Co., R. H. 214
Bonded Scale Co. 214
Booth Cold Storage Company 212
Bradford Supply Co., Inc. 214

Carlyle Rubber Co. 207
Certified Materials Supply, Inc. 216
Cincinnati Machinery Co., Inc. 212
Coal Mine Equipment Sales Co. 214
Columbine Mine Equipment Co., Inc. 208, 209, 218, 219
Commercial Metals Company 215

Darien Corp. 214
Dietrick, E. P. 216
Down State Coal Company 207
Duquesne Electric Mfg. Co. 213, 215

Electric Equipment Co. 214
Electric Service Co., Inc. 206
Emerson Electric Co. 216

Farr, Charles D. 217
Fish, Charles V. 207
Florence Machy. & Supply Co. 211
Foster Co., L. B. 214, 215
Frank, M. K. 215

Gavenda Bros., Inc. 213
Gillespie & Son, Thomas 216
Greensburg Machine Co. 210
Guyan Machinery Co. 212

Harris-Walsh, Inc. 206

Industrial Equipment Corp., The 214

Jones & Co., R. C. 207

Kaiser Company, Inc. 212
Kirk Company, Wallace E. 210
Kovalchick Salvage Co. 214

Locke Company, C. B. 214
Lorraine, G. B. 206
Love & Amos Coal Co. 207

MacCabe Co., T. B. 215
Mansbach Metal Co. 210
Manufacturers Equipment Co. 215
Midwest Steel Co. 215
Mississippi Valley Equipment Co. 210
Moorhead Electrical Machinery Co. 210
Morrison Railway Supply Corp. 215
Morse, E. J. 206

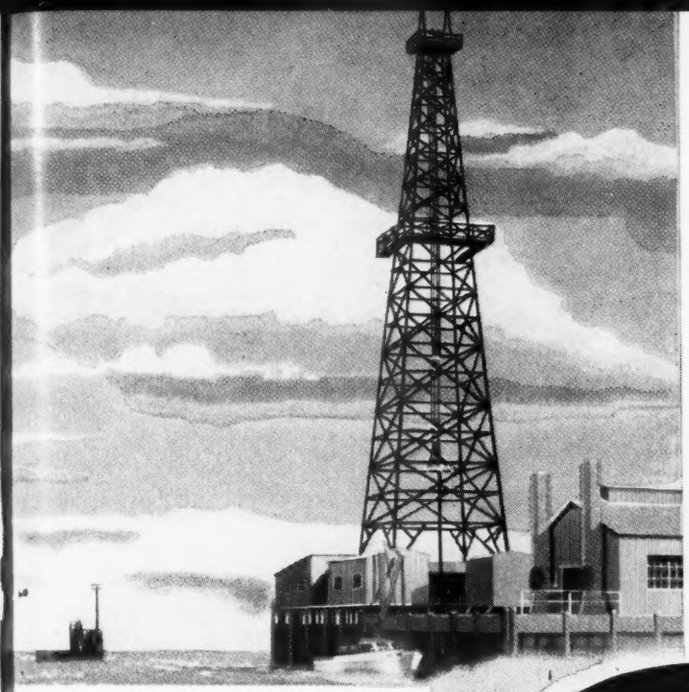
O'Neill, A. J. 215

Pan American Engineering Co. 212
Penowa Coal Company 216
Philadelphia Transformer Co. 212
Prater, Bruce 216

Smith Co., Inc., H. Y. 210
Stanhope, Inc., R. C. 214
Sunnhill Coal Company 206
Swabb Equipment Co., Frank 206, 216
Swan Creek Mining Co. 206

Templeton-Matthews Corp. 206
Tippins Machinery Corp. 212, 216

Wagner Co., Arthur 216



In Galveston Bay, huge rotary drilling rigs bore nine thousand feet under the sea for oil. Long strings of pipe put tremendous shock loads on wire rope. TRU-LAY Preformed stands up extremely well even under such treatment.

Breaking up hard-packed earth is the first step in grading for water drainage in Nebraska. These earth-breaking machines put constant gruelling strains on the wire rope. Here again, TRU-LAY Preformed gives longer, lower cost service.

Hoisting a completely loaded box car onto a Seatrain for over-water journey from Edgewater, N. J., to Texas City. TRU-LAY Preformed is hard at work every day on thousands of huge overhead traveling cranes like these—giving good service.

Far down below ground in West Virginia's soft coal fields, under-cutting machines claw at the walls of coal. Here wire rope is expendable. TRU-LAY Preformed of correct construction adds many extra hours of service—lowers over-all costs.

ACCO

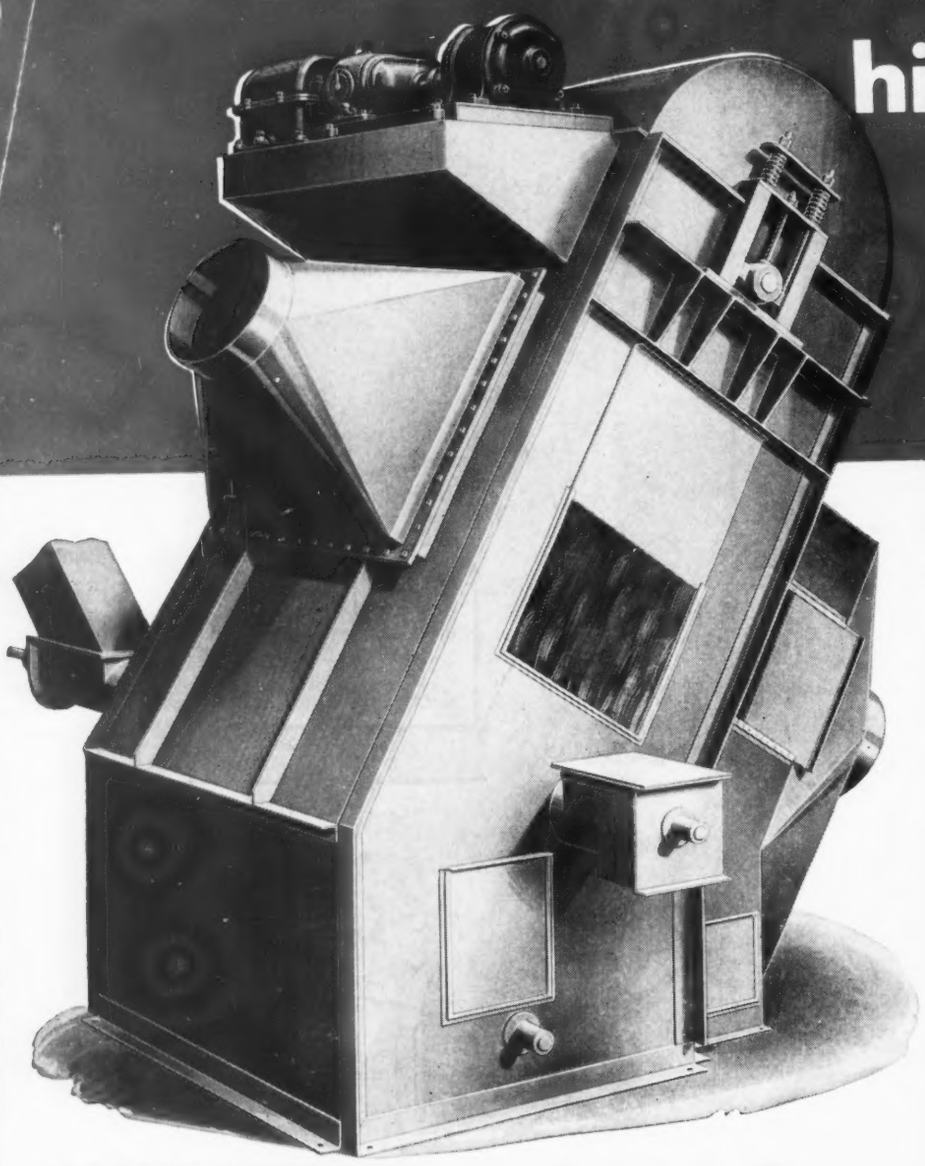
Wilkes-Barre, Pa., Atlanta, Chicago, Denver, Houston, Los Angeles, New York, Philadelphia, Pittsburgh, Portland, San Francisco, Tacoma, Seattle, Bridgeport, Conn.

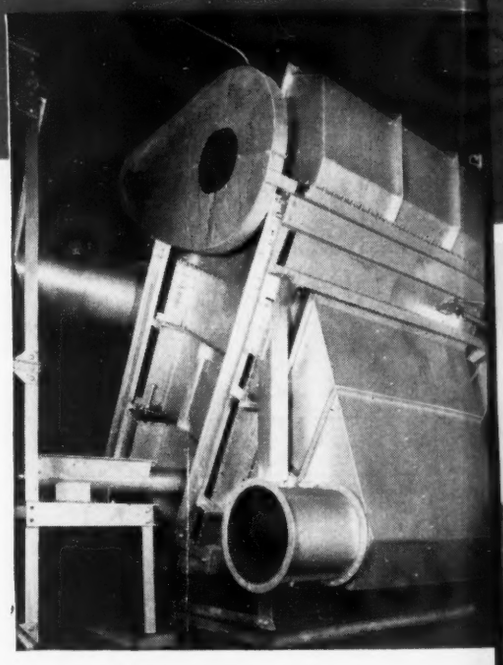
AMERICAN CABLE DIVISION
AMERICAN CHAIN & CABLE

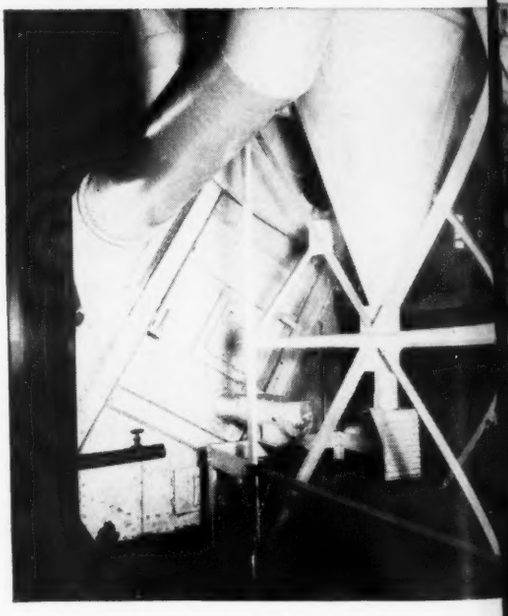
In Business for Your Safety

Tru-Lay *Preformed* **Wire Rope**

The answer to the problem of high moistur COA







LINK-BELT *Multi-Louvre Dryer*

Another step forward in coal preparation technology. The Multi-Louvre is *the* low-cost, high-efficiency unit for drying coal. It is outstanding for many reasons, such as:

—Exceptionally low horsepower requirements.

—First cost lower than conventional types of coal dryers.

—Minimum of degradation.

—Short contact time with the drying air; large pieces do not tend to overheat.

—The dryer that successfully handles fine coal without breakage or oxidation.

—Simplicity in control of temperatures and volume of drying air.

—Cooling section may be very easily added, for cool discharge into cars or bins.

—Operation and maintenance extremely simple and economical. It is essentially an apron conveyor.

Illustrations at the right show details of a typical installation drying coal for coking purposes. Why not call on one of our engineers to give you the complete story? Send for Book No. 2209.

LINK-BELT COMPANY Chicago 9, Philadelphia 40, Pittsburgh 13, Wilkes-Barre, Huntington, W. Va., Denver 2, Kansas City 6, Mo., Cleveland 13, Indianapolis 6, Detroit 4, St. Louis 1, Seattle 4, Toronto 8.

COAL PREPARATION AND HANDLING EQUIPMENT

Engineered, Built and Backed by LINK-BELT